

**ASSESSMENT OF EXISTING TEST REPORTS FOR EVALUATING
VOC CONTROL EFFECTIVENESS**

Prepared by:

Brent W. Hall and Carl F. Singer

ARCADIS Geraghty & Miller
4915 Prospectus Drive
P.O. Box 13109
Research Triangle Park, NC 27709

EPA Contract No. 68-D2-0063
Work Assignment No. 0/009

EPA Project Officer: Chester A. Vogel

U.S. Environmental Protection Agency
National Risk Management Research Laboratory
Research Triangle Park, NC 27711

Prepared for:

U.S. Environmental Protection Agency
Office of Research and Development
Washington, DC 20460

ABSTRACT

Recent work for the U.S. Environmental Protection Agency (EPA) has led to analysis of existing test reports in the Office of Air Quality Planning Standards (OAQPS) for evaluation of volatile organic compound (VOC) control device effectiveness. This report will present the approach taken during this task to review existing test reports and identify missing data points. A format to provide guidance and serve as the basis for all future databases involving VOC control effectiveness is also presented. This format will serve as a summary page to be attached to each test report for quick reference. Results indicate average control device efficiencies of 91 to 96 percent based on the methods used and the particular device tested. It should be noted that the populations considered in this task were small and based on data from only two states.

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
ABSTRACT	ii
LIST OF FIGURES	iv
EXECUTIVE SUMMARY	v
1.0 INTRODUCTION	1
2.0 METHODS AND MATERIALS	3
2.1 Input Materials	3
2.2 Explanation of Input Form	6
2.3 Explanation of Output Form	10
3.0 RESULTS	12
3.1 Sorting Results	12
3.2 Analysis of Data	13
3.3 Discussion of Remaining Data Gaps	18
4.0 CONCLUSIONS	20
5.0 RECOMMENDATIONS	22
6.0 REFERENCES	23
APPENDIX A—FORM DEFINITIONS	A-1
APPENDIX B—SUMMARY PAGES	B-1
APPENDIX C—REPORT REVIEWS	C-1

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. OAQPS Database Structure.	4
2. Blank Plant Input Form.	8
3. Blank Test Input Form.	9
4. Example Summary Page.	11
5. Summary of Plant Data Recovered.	14
6. Summary of Test Data Recovered.	15

EXECUTIVE SUMMARY

In 1988, research to investigate the status of volatile organic compound (VOC) emissions and to determine if VOC control devices were operating as designed was performed for the U.S. Environmental Protection Agency (EPA). The primary goal of the study was to assess VOC control device effectiveness and to determine if future efforts were needed in this area. Results indicated that there were emerging and recurring problems with the control of VOCs that needed further investigation. Subsequent studies were conducted to continue this work effort and to further define the problems associated with VOC control. Testing was performed for EPA's National Risk Management Research Laboratory, during full-scale commercial operation of VOC control devices, to begin developing a database to document the performance of control devices currently in operation. However, the costs associated with testing in-place control devices limited the study to a small number of tests.

Subsequent to the limited field tests, it was decided to search existing data on operational VOC control devices. This search led to a database being developed by EPA's Office of Air Quality Planning and Standards (OAQPS) for emission factor development. This database of field sampling test reports from state agencies and other various sources was obtained from OAQPS for use in the current work effort.

Current work focuses on reviewing existing test reports and identifying missing control device effectiveness information. Approximately 400 test records in dBASE III Plus format were obtained. These records were sorted based on predetermined criteria related to the previous studies to identify controlled emissions from surface-coating plants. Four separate sorts yielded 63 test records that were

related to VOCs and eliminated plants known not to be surface-coating industries. A control device of interest pertained to each of these 63 test records. These records were used throughout the remainder of the current task.

Another goal was to develop a format for future databases. This would provide guidance and serve as the basis for future databases involving VOC control effectiveness. The database would be used to make a summary page to be attached to the front of each emission source test report. This would facilitate finding information related to VOC control effectiveness for a particular plant or control device. In addition, the summary page would serve as a quick reference for tracking control device performance over a period of time.

After developing a database format, control effectiveness data identified in this task were filled in for each test report. Several important items of information were consistently not found in reviewing the test reports including control device residence time and installation date. Pertinent information from the actual source test was also frequently missing or inadequate including solvent usage rate and gas flow rates.

The average control device efficiency of catalytic incinerators was 92 percent based on EPA Method 25 type measurements of total gaseous non-methane organics (TGNMO) and 95 percent based on EPA Method 25A type measurements of total hydrocarbons (THC). The average control device efficiency of thermal incinerators was 96 percent based on TGNMO and 91 percent based on THC. Populations considered in this task were small and geographically biased.

SECTION 1

INTRODUCTION

The surface-coating industry is known to be a major contributor of anthropogenic volatile organic compound (VOC) emissions. These emissions originate from the coating of various substrates such as film, metal coils, magnetic wire, and appliances. The pollutant is emitted when the VOC-laden coating is applied to the substrate and subsequently dried in an oven. Ozone is formed when VOCs photochemically react with nitrogen oxides in the atmosphere. Because of the regulations promulgated by the U.S. Environmental Protection Agency (EPA) and various state and local agencies, VOC emissions must be controlled by some proven control technology. The 1990 Clean Air Act Amendments (CAAAAs) require EPA to develop and promulgate even more stringent regulations because of the large number of ozone non-attainment areas in the country and the need to specifically demonstrate control of an expanded list of hazardous air pollutants (HAPs).

Many technologies are available for the control of VOCs, but the population of control devices is dominated by three separate types—carbon adsorbers, catalytic incinerators, and thermal incinerators. The appropriate device is chosen based on process-specific conditions. Although many other types of VOC control devices exist, these three were used for the purposes of this study.

Previous studies have indicated that VOC control devices may deteriorate during operation over time and adversely affect unit performance. Control effectiveness is defined as this deterioration in performance over time. Information exists that documents possible causes of degradation but not the extent or associated time frame. The goal of this study was to utilize existing source test data to evaluate

control effectiveness for VOC control devices currently in operation. The most informative method of evaluating deterioration of control effectiveness would be comparing separate test reports for the same source conducted at different times. Because reports meeting this criterion were not found, current levels of control effectiveness were compared with design efficiency to evaluate deterioration.

Another goal of this study is to compose the information extracted from the test reports into a format to be used for future databases. This will produce a summary page(s) to be attached to the full test report, which will facilitate quick and simple data analysis. In addition, this summary page will serve as a guide for future work to be conducted in the area of VOC control effectiveness.

SECTION 2

METHODS AND MATERIALS

2.1 INPUT MATERIALS

A dBASE III Plus database file, VOC_DATA.DBF, was received, containing 394 records extracted from an Office of Air Quality Planning and Standards (OAQPS) Technical Support Division (TSD)/Emission Inventory Branch (EIB)/Emission Factor and Methodologies Section (EFMS) database.¹ The original OAQPS database was available but was not used in this task to avoid duplication of sorting efforts. A separate database was also received regarding emissions in California, but no control device or emission data were found in this file. VOC_DATA.DBF was, therefore, exclusively used in this task to identify VOC emission reports from surface-coating plants with an installed control device.

The OAQPS database records correspond to test reports provided by states and available through OAQPS. This dBASE format is the OAQPS recommendation for a future database, and it also represents an input format because the database was filled in directly from each report.² No additional documentation is available on the OAQPS database at this time. Review of control effectiveness requires additional information to account for operating conditions, control device age, test methods, maintenance schedules, etc. The OAQPS recommendations were retained, as much as was practical, in the new database. The database received from OAQPS incorporated the fields shown in Figure 1.

```

Structure for database:      G:\DBASE\VOCS\VOC_DATA.DBF
Number of data records:    395
Date of last update:      12/17/92
Field      Field Name      Type      Width      Dec      Index
1          FACILITY      Character 30          N
2          SCC          Character 8           N
3          AGENCY      Character 4           N
4          TES_DATE     Date      8           N
5          ADDRESS     Character 20          N
6          CITY        Character 15          N
7          STATE      Character 2           N
8          ZIP          Character 5           N
9          PROC_DESC   Character 25          N
10         TYPE_PROC   Character 55          N
11         POLLU_1    Character 11          N
12         C_DEVICE   Character 25          N
13         C_EFFICI   Numeric   5           2      N
14         PROC_RATE   Numeric   8           2      N
15         UNIT        Character 12          N
16         EM_RATE    Numeric   11          6      N
17         UNITS_EM   Character 12          N
18         TST_METH   Character 6           N
19         TRAIN      Memo      10          N
20         NOTES      Memo      10          N
21         EM_FACTOR   Numeric   11          6      N
22         EF_UNITS   Character 12          N
23         RATTING    Character 1           N
** Total   **                307

```

Figure 1. OAQPS database structure.

A sorting procedure was performed on the dBASE III Plus file in order to focus on surface coaters with operating VOC control devices of interest. Records meeting each subsequent test were saved in a new dBASE IV file to facilitate analysis by various researchers. Discussion of the sorting process is presented in Section 3.

Files received contained reports reviewed under a previous contract and spreadsheets printed in Excel software format with analysis of these reports. These reports were all found in the OAQPS database. The Excel printouts were used as a starting point for database development because many factors affecting VOC control effectiveness were recorded. The Excel files did not, however, lend themselves to a database format because each spreadsheet contained unique fields specific to individual reports.

Copies of reports identified from sorting the OAQPS database were obtained. These hard copies were used for this work effort. Source Classification Codes (SCC), process description, type of process, and data quality ratings were extracted from the OAQPS database when possible. When a data quality rating was not available, the reviewer assigned a rating based on OAQPS recommendations for developing AP-42 emission factors.³ These ratings were based on the following criteria:

- A. Multiple tests performed on the same source using sound methodology and reported in enough detail for adequate validation
- B. Tests that were performed by a generally sound methodology but lack enough detail for adequate validation
- C. Tests that were based on an untested or new methodology or that lacked a significant amount of background data
- D. Tests that were based on a generally unacceptable method but may provide an order-of-magnitude value for the source

Detail for validation includes adequate source operation information, sampling protocols, and raw data and calculations.

The review of the test reports indicated that much of the information needed to evaluate control effectiveness was not reported. Additional specific data were requested from eight plants to fill in hardware information not found in the test reports. Three responses were received. Prior Coated Metals (link code - dfn002) supplied all requested additional information including date control device was installed, design residence time, design destruction efficiency, demonstrated destruction efficiency, and incinerator support fuel. Gomar Manufacturing (link code - cs001) supplied all requested additional information including date control device was installed, design flow rate, design residence time, design operating temperature, design destruction efficiency, demonstrated destruction efficiency, and incinerator support fuel. Keuffel & Esser (link code - pg1) replied that the device was no longer operating and the facility was being closed. The additional data received are included in the summary pages in Appendix B.

2.2 EXPLANATION OF INPUT FORM

A database was built in dBASE IV, which allows flexibility in preparing different reports based on the end users' needs. dBASE IV also allows sorting of the fields which will facilitate analysis. Input data were split between two dBASE files which are linked by an arbitrary reference code. This format allows analysis of plant and control device performance at a specific set of conditions and comparison of results as these conditions change (e.g., as the control device ages, catalyst changes). Plant specific data were entered in a file named PLANT.DBF, which contains information about the plant and control device detailed in the test report. Although only one control device is usually tested in each test report, reports with multiple control devices tested will have separate records and link codes for each control device. Test and pollutant specific data were entered into a file named TESTS.DBF, which contains information specific to measurements made during a source test. A single test report will generally contain three separate tests of a control device, usually on the same day. All fields in the OAQPS database were retained, except those that may be calculated by the end user as the situation requires. Emission rates are reported in pounds of carbon per hour (lb C/h) obviating the need for UNITS_EM

field in the OAQPS database. Furthermore, the VOC test method usually dictates the sampling train; therefore, the TRAIN field was eliminated. EM_FACTOR and EF_UNITS fields were not used. Emission factors may be reconstructed in a new report using the usage rate units, though these units may not be identical to the original OAQPS database.

Input forms were developed to mirror the two database files, PLANT.DBF and TEST.DBF. Blank input forms are shown in Figures 2 and 3. Definitions used for these forms are provided in Appendix A. Some fields on each form may not be applicable to a specific facility but the fields were retained to keep all information in a common database. An arbitrary link code was included on both forms to allow test-specific data to be linked with plant-specific data. The plant form includes plant name and address to facilitate possible future contacts. The plant form also contains the data quality rating and manufacturing information such as SCC and process description, and control device information. This information allows a user to segregate the effects of process changes that may result in different gas compositions. The test form contains the plant name and city to provide continuity for the user. The test form contains information pertinent to a specific run including solvent usage rate, gas flow rates, solvent gas phase concentration, and test methods. Inlet and outlet temperatures on the test input forms are recorded from the sample points and do not necessarily reflect the control device operating temperature or the catalyst ΔT . For the purposes of this database, inlet catalyst temperature was used as the control device operating temperature for catalytic incinerators and used to calculate actual volumetric flow necessary to estimate residence time. Emission rates, destruction and removal efficiency (DRE), and capture efficiency are calculated from the test data.

VOC Control Effectiveness
Plant Worksheet

Internal Report Code

Plant Name

Address

Address

Plant City

Plant State

Plant ZIP Code

Test Date (mm/dd/yyyy)

Agency

Data Quality Rating

SCC

Process Description

Type of Process

Line Designation

CEM/Monitoring Device Installed

Control Device Designation

Control Device Type

Manufacturer

Date Installed (mm/dd/yyyy)

Design Gas Flow Rate (dscfm)

Design Residence Time (s)

Design Operating Temperature (°F)

Design Efficiency (%)

Demonstrated Efficiency (%)

Fuel

Sorbent/Catalyst Type

Sorbent/Catalyst Age (yr)

Notes

Figure 2. Blank plant input form.

VOC Control Effectiveness
Test Worksheet

Internal Report Code

Plant Name

Plant City

Test Date

Test Time (hh:mm)

Pollutant

Test Designation

Average Operating Temperature (°F)

Device Residence Time

Catalyst ΔT (°F)

Sorbent Regeneration Time (h)

Solvent Test Method (EPA 24,...)

Solvent Pollutant Content (#C/gal, #C/#)

Solvent Usage Rate (gal/h, #/h)

Usage Rate Units

VOC Test Method (EPA 25, EPA 25A, EPA 18,...)

Inlet Concentration (C ppmv dry)

Outlet Concentration (C ppmv dry)

Other Methods (EPA 1-4, ...)

Inlet Flow Rate (dscfm)

Outlet Flow Rate (dscfm)

Inlet Temperature (°F)

Outlet Temperature (°F)

Inlet Emission Rate (# C/h)

Outlet Emission Rate (# C/h)

DRE (%)

Total Enclosure? (Y/N)

Capture Efficiency (%)

Overall Emission Rate (# C/h)

Overall Control Efficiency (%)

Notes

Figure 3. Blank test input form.

2.3 EXPLANATION OF OUTPUT FORM

A summary page was generated from the dBASE IV files for each plant from the linked records. An example summary page is shown in Figure 4. The upper half of the summary page contains data specific to the plant and control device. The bottom half of the summary page contains the test specific information and the average operational and effectiveness data calculated from the individual test runs. An ASCII file report was generated by a dBASE IV program, and this file was imported into WordPerfect 5.1 through a macro to create the summary pages. Tests were performed by a dBASE IV program to distinguish inapplicable fields and not reported fields. If a tested numerical field contained zero, it was incorrectly identified as unreported because dBASE IV reads empty numerical fields as zero. This may occur if the sample temperature or the operating temperature is zero—an unlikely event for the control devices of interest. The format of this summary page is not necessarily optimal for all users. A user may choose to create a different dBASE report and/or a new Wordperfect macro to accommodate different content or style. An explanation of individual fields is presented in Appendix A. Summary pages for reviewed reports are presented in Appendix B.

PLANT CODE	cs002	PROCESS TYPE	primer coating oven/topcoater oven
FACILITY	Alcan Building Products	PROCESS	aluminum strip coating
ADDRESS	11 Cragwood Road	LINE DESIGNATION	DESIGN RES TIME (s) 0.082
	Woodbridge, NJ 07095	CONTROL DEVICE	DESIGN OP TEMP (degF) 800
TEST DATE	01/04/1990	TEST METHOD	NJ3
AGENCY	NJDEP	CONTROL TYPE	catalytic incinerator
RATING	B	CONTROL MANUF	FUEL natural gas
SCC	402900xx	DATE INSTALLED	n/r
		DESIGN FLOW (dscfm)	n/r
			SORBENT/CATALYST CSM Systems
			SORB/CAT AGE (yr) 0

NOTES Sorbent catalyst type is CSM Systems Inc. 378 ft2/ft3

11

POLLUTANT	TEST	---TEMPERATURE---			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		CAPTURE		OVERALL CONTROL EFFECT
		INLET	OUTLET	OPER			INLET	OUTLET	INLET	OUTLET	DRE	EFFIC	
		deg F	deg F	deg F	s	deg F	ppmv C	ppmv C	#C/h	#C/h	%	%	%
THC	1	350	445	660	n/r	300	4450.00	620.00	197.203	30.131	84.72	n/r	n/r
THC	2	350	430	640	n/r	265	4125.00	720.00	185.873	34.588	81.39	n/r	n/r
THC	3	350	442	595	n/r	265	5416.00	510.00	243.037	25.450	89.53	n/r	n/r
AVERAGE											85.21	n/r	n/r

n/a = data is not applicable.
n/r = data is not reported or data required for calculation is not reported.

Figure 4. Example summary page

SECTION 3

RESULTS

3.1 SORTING RESULTS

The dBASE III Plus file contained 394 records representing a first-cut sort of the OAQPS database to eliminate specific non-VOC sources. The dBASE file was further sorted to eliminate the remaining non-VOC sources, which consisted primarily of acid gases and resulted in the rejection of 88 records. The remaining records were sorted again to remove sources containing "none" in the C_DEVICE field. This sort eliminated an additional 56 records from consideration. The remaining records were then sorted to focus on the control devices of interest to this study—thermal incinerators, catalytic incinerators, and carbon adsorbers. This sort resulted in the elimination of 120 records from consideration. The rejected records consisted primarily of unspecified control devices, particulate control devices, acid gas scrubbers, and condensers. Non-surface-coating records were separated from the remaining records leaving 63 records from the original 394. Of these 63 records, 47 were associated with thermal or unspecified incinerators, 14 were associated with catalytic incinerators, and two were associated with carbon adsorbers. These records correspond with only 43 actual test reports, some reports being associated with more than one record. Of the 35 reports reviewed previously, only 17 reports were applicable to this work based on the sort criteria. The remaining 26 reports were reproduced from OAQPS hardcopies.

These reports were reviewed with the objective of obtaining data to fill in this database. Several fields in the OAQPS database were copied into this database if information was unavailable including

address elements, process description, type of process, SCC, and quality ratings. In reviewing reports, several fields in the original OAQPS database were found to be in error or missing. A plant identification code had been substituted for the ZIP Code in several instances. In addition, some records were incorrectly labeled as having no control device. Many data quality ratings were also missing from the OAQPS database, which were added consistent with ratings of reports in hand. In several cases, the report was missing sections that may contain some design or operating data. All reports were reviewed as received. A brief review of each report is presented in Appendix C with the identifying link code.

3.2 ANALYSIS OF DATA

Of the 43 reports identified by the sorting process, data for 36 control devices were retained from 34 test reports as probable surface coaters. Several reports contained inadequate descriptions for the reviewer to eliminate them as non-surface coaters and were therefore retained. Much of the facility data desired for the database were missing from the reports. Data recovered from the reports are summarized in Figures 5 and 6. The number of source tests containing each datum is indicated with the number of pertinent tests. For example, control device manufacturer was identified in 23 of the 36 total source tests, and catalyst ΔT was reported in 8 of the 13 catalytic incinerator source tests.

One intention of this task was to recover data from available test reports to show the effect of control device age on control device effectiveness. Repeat testing data were only available for one facility (Unifoil) at test times greater than 1 year apart; however, the two reports were not of comparable quality. An alternative to same plant testing data is to compare device operation with design parameters. Only four of the site test reports contained design efficiency, and only one report sufficiently identified the age (new) of the control device. Age and design efficiency of two additional control devices were obtained by contacting test sites. Prior Coated Metals (link code - dfn002) and Gomar Manufacturing (link code - cs001), plants with thermal incinerators installed 7 years before the reviewed tests,

Plant Worksheet

36/36	Plant Name
29/36	Address
36/36	Plant City
6/36	Plant State
26/36	Plant ZIP Code
36/36	Test Date (mm/dd/yyyy)
36/36	Agency
36/36	SCC
35/36	Control Device Type
23/36	Manufacturer
1/36	Date Installed (mm/dd/yyyy)
8/36	Design Gas Flow Rate (dscfm)
6/36	Design Residence Time (s)
13/36	Design Operating Temperature (°F)
4/36	Design Efficiency (%)
0/36	Demonstrated Efficiency (%)
13/35	Fuel
5/14	Sorbent/Catalyst Type
1/14	Sorbent/Catalyst Age (yr)

Figure 5. Summary of plant data recovered.

Test Worksheet

29/36	Test Time
36/36	Pollutant
n/a	Test Designation
12/36	Average Operating Temperature (°F)
n/a	Device Residence Time (s)
8/13	Catalyst ΔT (°F)
0/1	Sorbent Regeneration Time (h)
n/a	Solvent Test Method (EPA 24,...)
13/36	Solvent Pollutant Content (#C/gal, #C/#)
27/36	Solvent Usage Rate (gal/h, #/h)
n/a	Usage Rate Units
31/36	VOC Test Method (EPA 25, EPA 25A, EPA 18,...)
34/36	Inlet Concentration (C ppmv dry)
36/36	Outlet Concentration (C ppmv dry)
34/36	Inlet Flow rate (dscfm)
36/36	Outlet Flow rate (dscfm)
33/36	Inlet Temperature (°F)
35/36	Outlet Temperature (°F)

Figure 6. Summary of test data recovered.

demonstrated 94 and 99 percent DRE, respectively, compared to 99 percent design efficiency. Graphic Packaging Corporation (link code - pg6), a plant with a new catalytic incinerator, demonstrated 97 percent DRE with a design efficiency presumed, though not given, to be 95 percent. This small sample should not be interpreted as representative of a large population of VOC control devices.

Many of the test reports used New Jersey Air Toxics methods (NJ 3.), which are generally comparable to EPA VOC methods. The New Jersey methods include a continuous emission monitor method analogous to EPA 25A (NJ 3.7) and a grab sample gas chromatograph method comparable to EPA 18 (NJ 3.9).⁴ In the OAQPS database, tests based on New Jersey methods were rated equivalent in data quality to tests based on EPA methods. The New Jersey methods and the EPA methods were assumed to be equivalent in this study as well. If test methods required by specific state or local agencies are not in fact equivalent, a bias on emissions and control effectiveness may result corresponding to the geographical location of a group of VOC sources.

Difficulties were encountered with unreliable solvent usage rates. Usage rates were primarily based on plant production rates and average solids "laydown." Varying solids content, VOC composition, and uncertainty in laydown may result in unreliable estimates of solvent usage resulting in unreliable estimates of capture efficiency. This may result in varying capture efficiencies or capture efficiencies that are biased either above or below actual levels. Capture efficiencies greater than 100 percent were seen in this task; however, this may also be attributable to poor inlet emission estimates. Moreover, solvent/coating usage was occasionally provided without composition information, making it difficult to compare with lb C/h obtained from EPA Methods 25 and 25A. New Jersey facilities are often required to compare solvent usage to the sum of all speciated inlet emissions for capture calculations. This method does not account for compounds below detection limits (BDL) or for compounds not specified for analysis. Furthermore, capture efficiency may be different for different compounds. Speciated emissions were not added together for capture estimates under this task.

Six facilities were considered to have 100 percent capture because they met "EPA procedure T" type requirements for total enclosure.⁵ Some facilities achieve significant VOC destruction between the application point and the control device inlet sampling point, usually via incineration in the heater or the bake-off oven. If the inlet sample point emissions were used for capture determination, the VOCs destroyed in the incinerator would appear as fugitives despite actually being destroyed. Total enclosure ensures that all the solvent used is sent to the control device. Capture efficiency will be underestimated for plants achieving VOC destruction between the application point and the inlet sample point but not documenting total enclosure. Sufficient information was available to estimate capture efficiency for 11 additional facilities.

Speciated data often result in BDL concentrations in the condensate or the bag. Use of the detection limit in such cases not only biases emission estimates but significantly biases DRE, sometimes resulting in negative DRE at low inlet concentrations. Although the use of zero in these cases may slightly bias emissions, it may more accurately represent DRE while not affecting an air shed's emissions because the specific emission rate is low. Zero was used in this database at the discretion of the reviewer.

Several reports also had anomalous flow rates where the outlet flow rate was found to be substantially less than the inlet flow rate. This situation may result from poor data quality or poor closure around the system. Assuming the data are of adequate quality, gas may be leaking from the duct between the inlet and outlet sample ports. If this occurs after the control device, outlet emissions are being underestimated resulting in high DRE. If the leak occurs before the control device, inlet emissions are being overestimated resulting in underestimated DRE and overestimated capture efficiency.

Reports reviewed indicated one test on one carbon adsorber, 13 tests on catalytic incinerators, 21 tests on thermal incinerators, and one type unidentified incinerator. Twenty-eight tests were conducted in New Jersey, seven in Pennsylvania, and one in Texas—representing a fairly

geographically biased population. The results may be biased from the general population of control devices installed on surface coating operations because of local process types, solvent composition, regulations, auditing requirements, weather, etc. Furthermore, the amount of data recovered may not be representative of a large population of test reports because reporting requirements may vary with location. Thirteen of the tests had data rated "C," which may not be suitable for inventory purposes. The carbon adsorber facility reviewed contained speciated data for chloroform resulting in 98 percent DRE. The data quality was rated "A."

Catalytic incinerators are generally required to meet 95 percent DRE, which is reflected in design efficiency. The average DRE for five catalytic incineration facilities based on TGNMO was 93 percent with a range of between 88 and 98 percent. The average DRE for seven catalytic incinerators based on THC was 96 percent with a range between 85 and 100 percent. The average DREs using only "A" and "B" quality data were 92 (n = 3) and 95 (n = 3) percent with ranges of 88 to 98 percent and 85 to 100 percent for TGNMO and THC, respectively.

Thermal incinerators are generally capable of 99+ percent DRE, which is also reflected in design efficiency. The average DRE for five thermal incinerators based on TGNMO was 96 percent with a range between 92 and 99 percent. The average DRE for 13 thermal incinerators based on THC was 92 percent with a range between 53 and 99 percent. The average DREs using only "A" and "B" quality data were 96 (n = 4) and 91 (n = 11) percent with ranges of 92 to 99 percent and 53 to 100 percent for TGNMO and THC, respectively.

3.3 DISCUSSION OF REMAINING DATA GAPS

The report review revealed many data gaps. Some of the missing data may be obtained from either plant contacts or reviewing permit applications from appropriate authorities. Most of the reports were prepared in response to permit requirements, generally permits to build or modify an existing control device. Correspondence between the state agency and the facility concerning test protocol and test dates was generally available. The state or local agency may require other conditions in addition to

a source test including operating temperature and residence time. The facilities' responses to requirements other than demonstrated DRE and capture and/or the data resulting from compliance to these other provisions were not generally available in the test report. Information that may be obtained by contacting the state agency or the facility includes control device design information, control device installation date, demonstrated DRE, and some operating information that may be archived, principally operating temperatures.

In addition to data that may be available through direct plant contacts, many data gaps exist that will not be recoverable. These include information such as usage rates, carbon content of solvent/coating, and total enclosure verification. This information would have to be obtained while testing or on the coating/solvent being used. It is recommended that information sufficient to express solvent usage as lb C/h be included in test reports because EPA Method 25, 25A, and 18 results may all be reduced to this format. Comparison of inlet emissions to solvent usage may illustrate response factor problems and/or solvent usage rate inaccuracy. However, because of state and local regulations, many plants provided solvent information in terms of total weight of VOC or volatile organic substance without regard to carbon content. Furthermore, the solvent may be analyzed only for the solvents specified by the state or local agency and omit other VOC. Usage data in this format cannot be compared effectively with THC or TGNMO inlet emissions because of unknown carbon composition of the solvent. Because testing was generally done for permitting purposes, testing and analysis were performed as specified at the state level. The frequency and quality of solvent usage and solvent composition information needed to estimate capture efficiency, reflected in this report, may not be representative of a broad population of test reports because the available reports were predominantly from New Jersey and Pennsylvania.

SECTION 4
CONCLUSIONS

The following can be concluded from the assessment of existing test reports for evaluating VOC control effectiveness:

- ! From the 394 records supplied, 36 site tests were appropriate for review under this task.
- ! The 36 site tests included one on carbon absorption, 13 on catalytic incineration, 21 on thermal incineration, and one unidentified incineration facility.
- ! Four of the 36 facilities reviewed contained design efficiencies while only one of the 36 facilities contained adequate information to establish control device age.
- ! Two of the 36 facilities reviewed contained only outlet data.
- ! The data quality for 13 of the 36 facilities reviewed were rated "C" in the OAQPS database.
- ! Average DRE of catalytic incinerators reviewed based on tests rated as "A" and "B" quality TGNMO data was 92 percent.
- ! Average DRE of catalytic incinerators reviewed based on tests rated as "A" and "B" quality THC data was 95 percent.
- ! Average DRE of thermal incinerators reviewed based on tests rated as "A" and "B" quality TGNMO data was 96 percent.
- ! Average DRE of thermal incinerators reviewed based on tests rated as "A" and "B" quality THC data was 91 percent.

- ! Information on control device age was not generally reported though most reports reviewed had new or recently modified control devices.
- ! Plant-specific information may be obtained by appropriate personnel by contacting the facility and state.
- ! Control effectiveness could not be ascertained from the reviewed reports because of the scarcity of design and installation information available.

SECTION 5

RECOMMENDATIONS

Acquiring additional data from other states or geographical areas would help to develop a well-rounded population. Reports from different states will indicate whether the completeness and data quality issues noted are common. If similar problems arise with new reports, follow-up contacts with facilities or regulating agencies would help to fill in data to facilitate comparisons with either design values or previous test results. Selective follow-up testing of facilities may be required to evaluate control effectiveness. Additional data from other reports would allow analysis based on geographic area, as well as more representative populations of each control device type. Emissions and DRE could be compared to other databases, such as the Aerometric Information Retrieval System (AIRS)⁶, to estimate the extent of degradation from facility estimates of control efficiency.

Adding certain data to future test reports may also be helpful in evaluating control effectiveness and emission inventories. Hardware information such as installation date and design efficiency would aid in evaluating control device degradation. Information sufficient to convert solvent usage rates to solvent carbon usage rates would be useful to estimate capture efficiency in many facilities.

A long-term goal could be the development of a VOC control device inventory. This would be useful to many agencies and locales for various analyses. It could serve as the basis for development of other inventories relating to control effectiveness.

SECTION 6

REFERENCES

1. Vogel, C.A. (EPA/NRMRL-RTP), to Brent W. Hall, February 15, 1993.
2. Myers, R.E. (EPA/OAQPS), Personal communication with Carl Singer, March 15, 1993.
3. Compilation of Air Pollutant Emission Factors, 4th edition, AP-42, September 1985, GPO Stock No. 055-000-00251-7, Office of Air Quality Planning and Standards.
4. Title 40, Code of Federal Regulations, Part 60, Appendix A, July 1, 1991, EPA Methods 18, 25A.
5. Title 40, Code of Federal Regulations, Part 60, Appendix A, EPA Method 30.
6. AIRS, Aerometric Information Retrieval System, User's Guide AA1:Introduction, August 1993, Office of Air Quality Planning and Standards.

APPENDIX A
FORM DEFINITIONS

VOC Control Effectiveness

Plant Worksheet

Internal Report Code

Plant Name

Address

Address

Plant City

Plant State

Plant ZIP Code

Test Date (mm/dd/yyyy)

Agency

Data Quality Rating

SCC

Process Description

Type of Process

Line Designation

CEM/Monitoring Device Installed

Control Device Designation

Control Device Type

Manufacturer

Date Installed(mm/dd/yyyy)

Design Gas Flow Rate (dscfm)

Design Residence Time (s)

Design Operating Temperature (°F)

Design Efficiency (%)

Demonstrated Efficiency (%)

Fuel

Sorbent/Catalyst Type

Sorbent/Catalyst Age (yr)

Notes

Internal Report Code - Arbitrary code used to link PLANT.DBF and TEST.DBF databases.

Plant Name - Name of manufacturer and division.

Address - Mailing address of the manufacturing plant.

Plant City - City location of manufacturing plant.

Plant State - State location of the manufacturing plant.

Plant ZIP Code - ZIP Code at the manufacturing plant.

Test Date - Testing start date.

Agency - Governmental agency requiring the test.

Data Quality Rating - Data quality rating assigned to the report as per the draft EPA document, "Technical Procedures for Developing AP-42 Emission Factors and Preparing AP-42 Sections," (March 6, 1992). When available, data quality ratings were retained from the OAQPS dBASE files.

SCC - Source Classification Code as per the EPA document, NEDS Source Classification Codes and Emission Factor Listing, (October 1985). This study used the SCC supplied in the OAQPS dBASE files.

Process Description - Description of process (i.e., what is being manufactured).

Type of Process - Description of the application method.

Line Designation - Plant designation of the manufacturing lines being tested.

Control Device Designation - Plant designation of the VOC control device being tested.

CEM/Monitoring Device Installed - Type of device used by the plant to continuously monitor control device performance.

Control Device Designation - Plant or report specification of the control device being tested. This line inserted to avoid confusion when a plant uses more than one control device.

Control Device Type - Type of control device being tested. This database was limited to thermal incinerator, catalytic incinerator, and carbon adsorber.

Manufacturer - Control device manufacturer.

Date Installed (dd/mm/yy) - Date control device was installed or put into service.

Design Gas Flow Rate - Flow rate at which control device was designed to operate.

Design Residence Time - Residence time in active zone of control device at design conditions.

Design Operating Temperature - Average temperature that control device was designed to operate.

Design Efficiency - DRE control device manufacturer guarantees or claims device will operate at under design conditions.

Demonstrated Efficiency - DRE demonstrated by testing after installation, typically required for initial permit.

Fuel - Primary combustion or support fuel used in incinerator.

Sorbent/Catalyst Type - Type of carbon/sorbent used in sorption system or type of catalyst used in catalytic incinerator system.

Sorbent/Catalyst Age - Calendar years between last change of sorbent or catalyst and testing.

Notes

VOC Control Effectiveness
Test Worksheet

Internal Report Code

Plant Name

Plant City

Test Date

Test Time (hh:mm)

Pollutant

Test Designation

Average Operating Temperature (°F)

Device Residence Time (s)

Catalyst ΔT (°F)

Sorbent Regeneration Time (h)

Solvent Test Method (EPA 24,...)

Solvent Pollutant Content (#C/gal, #C/#)

Solvent Usage Rate (gal/h, #/h)

Usage Rate Units

VOC Test Method (EPA 25, EPA 25A, EPA 18,...)

Inlet Concentration (C ppmv dry)

Outlet Concentration (C ppmv dry)

Other Methods (EPA 1-4, ...)

Inlet Flow Rate (dscfm)

Outlet Flow Rate (dscfm)

Inlet Temperature (°F)

Outlet Temperature (°F)

Inlet Emission Rate (# C/h)

Outlet Emission Rate (# C/h)

DRE (%)

Total Enclosure? (Y/N)

Capture Efficiency (%)

Overall Emission Rate (# C/h)

Overall Control Efficiency (%)

Notes

VOC Control Effectiveness Test Worksheet

Internal Report Code - Arbitrary code used to link PLANT.DBF and TEST.DBF databases.

Plant Name - Name of manufacturer and division.

Plant City - City location of the manufacturing plant

Test Date - Testing start date.

Test Time (hh:mm) - Short international format of time at the beginning of the test run.

Pollutant - Pollutant measured, generally dependent on the method of VOC analysis. TGNMO was used for EPA 25 or equivalent, THC was used for EPA 25A or equivalent, and analyte compound was used for EPA 18 or equivalent—sum of which was referred to as VOC.

Test Designation - Name used to designate the test, usually 1, 2, or 3.

Average Operating Temperature (°F) - Operating temperature in the active portion of the control device. This would correspond to combustion zone temperature in a thermal incinerator, catalyst inlet temperature in a catalytic incinerator, and average inlet and outlet gas temperatures in a carbon adsorber.

Device Residence Time - Gas residence time in active portion of control device

Catalyst ΔT (°F) - Temperature increase across catalyst bed in a catalytic incinerator.

Sorbent Regeneration Time (h) - Time period between taking a carbon bed off line and returning it to service via actual regeneration cycle.

Solvent Test Method (EPA 24,...) - Method used to quantify VOC content of coating

Solvent Pollutant Content (#C/gal, #C/#) - Organics content of the solvent as reported, units consistent with solvent usage rate to yield #C/h. While volatiles and moisture may give enough information for permit and emission factors, they are not adequate to quantify capture based on carbon emissions as recovered from EPA 25 and EPA 25A. EPA 18 analysis can also be reduced to a carbon basis and solvent composition and usage rate can be applied for each compound of interest.

Solvent Usage Rate (gal/h, #/h) - Usage rate reported by plant.

Usage Rate Units - Units given for solvent usage.

VOC Test Method (EPA 25, EPA 25A, EPA 18,...) - Test method used to analyze for VOC.

Inlet Concentration (C ppmv dry) - Concentration of organics at the inlet sample point converted to carbon equivalents.

Outlet Concentration (C ppmv dry) - Concentration of organics at the outlet sample point converted to carbon equivalents.

Other Methods (EPA 1-4, ...) - Test methods used to determine flow rate

Inlet Flow Rate (dscfm) - Average flue gas flow rate at the inlet sample point.

Outlet Flow Rate (dscfm) - Average flue gas flow rate at the outlet sample point.

Inlet Temperature (°F) - Average temperature at the inlet sample point.

Outlet Temperature (°F) - Average temperature at the outlet sample point.

Inlet Emission Rate (# C/h) - Emission rate at the inlet sample point based on inlet concentration and inlet flow rate.

Outlet Emission Rate (# C/h) - Emission rate at the outlet sample point based on outlet concentration and outlet flow rate.

DRE (%) - Destruction/Removal efficiency based on inlet and outlet emission rates to the control device.

Total Enclosure? (Y/N) - Logical variable to assign whether the line meets total enclosure criteria established by EPA. Inclusion of this variable prevents destruction of VOC taking place before the control device from being counted as fugitives by assuming 100 percent capture efficiency. Destruction taking place before the inlet sample point will lower the observed capture efficiency and raise overall emissions in facilities without total enclosure. Destruction of

VOC prior to the inlet sample point is common when curing ovens are fired with or in the vicinity of the flue gas.

Capture Efficiency (%) - Percentage of the VOCs used captured and sent to the control device based on usage rate and inlet emissions.

Overall Emission Rate (# C/h) - Outlet emissions rate plus usage rate not captured and sent to control device (fugitives).

Overall Control Efficiency (%) - Percentage of usage rate destroyed or removed.

Notes

Plant Name - Name of manufacturer and division.
Address - Mailing address of the manufacturing plant.
City - City location of the manufacturing plant.
State - State location of the manufacturing plant.
ZIP Code - ZIP Code at the manufacturing plant.
Date - Date that testing began.
Agency - Governmental agency requiring the test.
Data Quality Rating - Data quality rating assigned to the report as per the draft EPA document, "Technical Procedures for Developing AP-42 Emission Factors and Preparing AP-42 Sections, (March 6, 1992).
SCC - Source Classification Code as per the EPA document, NEDS Source Classification Codes and Emission Factor Listing, (October 1985).
Process Description - Description of process (i.e., what is being manufactured).
Process Type - Description of the application method.
Line Designation - Plant designation of the manufacturing lines being tested.
Control Device Designation - Plant designation of the VOC control device being tested.
Test Method - The VOC test method employed at both inlet and outlet during testing.
Control Device Type - Method employed to control VOC.
Control Device Manufacturer - Manufacturer of control device.
Date Installed - Date control device was installed.
Design Gas Flow Rate - Flow rate at which control device was designed to operate.
Design Residence Time - Residence time in active zone of control device at design conditions.
Design Operating Temperature - Average temperature control device was designed to operate at.
Design Efficiency - DRE control device manufacturer guarantees or claims device will operate at under design conditions.
Demonstrated Efficiency - DRE demonstrated by testing after installation, typically required for initial permit.
Fuel - Primary combustion or support fuel used in incinerator.
Sorbent/Catalyst Type - Type of carbon/sorbent used in sorption system or type of catalyst used in catalytic incinerator system.
Sorbent/Catalyst Age - Calendar years between last change of sorbent or catalyst and testing.
Pollutant - Pollutant being measured, usually defined by test method.
Test Designation - Run number assigned to test.
Inlet Temperature - Temperature at the inlet sample point.
Outlet Temperature - Temperature at the outlet sample point.
Operating Temperature - Average temperature in active zone of control device.
Residence Time - Actual control device residence time for a specific test.
Catalyst ΔT - Temperature rise across catalyst bed in catalytic incinerator.
Inlet Concentration - Concentration of VOC at control device inlet sample location (ppmv C equivalent dry basis).
Outlet Concentration - Concentration of VOC at control device outlet sample location (ppmv C equivalent dry basis).
Inlet Emissions - Flow rate of VOC flowing into control device at inlet sample location (#C/h)
Outlet Emissions - Flow rate of VOC flowing out of control device at outlet sample location (#C/h).
DRE - Destruction/Removal Efficiency of the control device; percentage of inlet emissions destroyed or removed by the control device.
Input Rate - Rate of VOC usage on the manufacturing lines tested (# C/h).

Capture Efficiency - Percentage of the input rate that gets captured and is therefore subject to control.

Overall Control Effectiveness - Percentage of the input rate destroyed or removed.

Average DRE - Arithmetic average of DRE for a specific pollutant and control device in this report.

Average Capture Efficiency - Arithmetic average of capture efficiency for a specific pollutant and grouping of manufacturing lines.

Average Overall Control Effectiveness - Arithmetic average of overall control effectiveness for a specific pollutant, control device, and manufacturing line in the report.

APPENDIX B
SUMMARY PAGES

PLANT CODE	dfn012	PROCESS TYPE	laminator coater w/carbon absorber	
FACILITY	Ciba-Geigy Corporation	PROCESS	coat polyester adhesive	
ADDRESS	556 Morris Avenue	LINE DESIGNATION		DESIGN RES TIME (s) n/r
	Summit, NJ 07901	CONTROL DEVICE	NJ Stack156	DESIGN OP TEMP (degF) 140
TEST DATE	05/07/1991	TEST METHOD	NJAT Method 3.9	DESIGN EFFIC (%) n/r
AGENCY	NJDEP	CONTROL TYPE	carbon absorption	DEMONSTRATED EFF (%) n/r
RATING	A	CONTROL MANUF	VIC Manufacturing	FUEL n/r
SCC	402999xx	DATE INSTALLED	n/r	SORBENT/CATALYST n/r
		DESIGN FLOW (dscfm)	2400.00	SORB/CAT AGE (yr) n/r

NOTES No audit samples analyzed in sample analysis. Design operating temperature is 95-185.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
chloroform	1	94	98	n/r	n/r	n/a	560.00	0.41	2.648	0.002	99.92	100.00	99.9
chloroform	2	97	98	n/r	n/r	n/a	470.00	1.70	2.135	0.007	99.67	100.00	99.6
chloroform	3	97	97	n/r	n/r	n/a	690.00	1.70	2.916	0.007	99.76	100.00	99.6
AVERAGE											99.78	100.00	99.7

- NOTES:
- 1 Units for solvent pollutant content are #C/#. Outlet emission rate is 0.002.
 - 2 Units for solvent pollutant content are #C/#. Outlet emission rate is 0.007.
 - 3 Units for solvent pollutant content are #C/#. Outlet emission rate is 0.007.

n/a = data is not applicable.
n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	cs002	PROCESS TYPE	primer coating oven/topcoater oven
FACILITY	Alcan Building Products	PROCESS	aluminum strip coating
ADDRESS	11 Cragwood Road	LINE DESIGNATION	
	Woodbridge, NJ 07095	CONTROL DEVICE	DESIGN RES TIME (s) 0.082
TEST DATE	01/04/1990	TEST METHOD	DESIGN OP TEMP (degF) 800
AGENCY	NJDEP	CONTROL TYPE	DESIGN EFFIC (%) 95.00
RATING	B	CONTROL MANUF	DEMONSTRATED EFF (%) n/r
SCC	402900xx	DATE INSTALLED	FUEL natural gas
		DESIGN FLOW (dscfm)	SORBENT/CATALYST CSM Systems
			SORB/CAT AGE (yr) 0.

NOTES Sorbent catalyst type is CSM Systems Inc. 378 ft2/ft3.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	350	445	660	n/r	300	4450.00	620.00	197.203	30.131	84.72	n/r	n/r
THC	2	350	430	640	n/r	265	4125.00	720.00	185.873	34.588	81.39	n/r	n/r
THC	3	350	442	595	n/r	265	5416.00	510.00	243.037	25.450	89.53	n/r	n/r
AVERAGE											85.21	n/r	n/r

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	pg2	PROCESS TYPE	metal coating incinerator
FACILITY	Apollo Metals, Inc.	PROCESS	sheet metal coating
ADDRESS		LINE DESIGNATION	towers 2 and 4
	Bethlehem, PA	CONTROL DEVICE	catalytic
TEST DATE	01/07/1988	TEST METHOD	EPA25
AGENCY	PaDER	CONTROL TYPE	catalytic incinerator
RATING	B	CONTROL MANUF	
SCC	40201801	DATE INSTALLED	n/r
		DESIGN FLOW (dscfm)	5000.00
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	n/r
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	n/r
		SORBENT/CATALYST	n/r
		SORB/CAT AGE (yr)	n/r

NOTES Agency is PaDER R3. Design gas flow rate is in scfm.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
TGNMO	1	141	339	n/r	n/r	n/r	3788.10	290.10	31.747	2.725	91.42	55.09	50.4
TGNMO	2	143	347	n/r	n/r	n/r	4140.80	239.80	32.884	2.232	93.21	48.20	44.9
TGNMO	3	143	349	n/r	n/r	n/r	3509.60	409.80	27.923	3.734	86.63	40.93	35.5
AVERAGE											90.42	48.07	43.6

NOTES: 1 Solvent pollutant content is in #C/#.
 3 Solvent pollutant content is in #C/# MABC-60.

n/a = data is not applicable.
 n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	pg3	PROCESS TYPE	metal coating incinerator
FACILITY	Apollo Metals, Inc.	PROCESS	sheet metal coating
ADDRESS		LINE DESIGNATION	tower #2, tower #4
	Bethlehem, PA	CONTROL DEVICE	catalytic i
TEST DATE	07/06/1988	TEST METHOD	EPA25
AGENCY	PaDER	CONTROL TYPE	catalytic incinerator
RATING	A	CONTROL MANUF	
SCC	40201801	DATE INSTALLED	n/r
		DESIGN FLOW (dscfm)	5000.00
NOTES	Agency is PaDER R3.		

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
TGNMO	1	113	382	n/r	n/r	62.5	3588.00	313.00	26.316	2.480	90.58	100.66	91.2
TGNMO	2	174	370	n/r	n/r	65	2129.00	328.00	15.599	2.492	84.02	59.67	50.1
TGNMO	3	194	349	n/r	n/r	52.5	2498.00	230.00	17.912	1.778	90.07	68.52	61.7
AVERAGE											88.22	76.28	67.7

NOTES:

- Solvent usage average of whole day. Solvent test method EPA24 mass balance, MAB-60 lacquer.
- Catalyst delta T average of before and after time of run. Solvent test method EPA 24 mass balance, MAB-60 lacquer.
- Solvent test method EPA 24 mass balance MAB-60 lacquer.

n/a = data is not applicable.
n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn017	PROCESS TYPE	
FACILITY	Crown Roll Leaf	PROCESS	Rotogravure Printing
ADDRESS		LINE DESIGNATION	
		CONTROL DEVICE	NJStack 005
TEST DATE	Paterson, NJ	TEST METHOD	
	08/09/1988	CONTROL TYPE	catalytic incinerator
AGENCY	NJDEP	CONTROL MANUF	
RATING	C	DATE INSTALLED	n/r
SCC	40201301	DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	n/r
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	n/r
		SORBENT/CATALYST	n/r
		SORB/CAT AGE (yr)	n/r

NOTES NJ Method 3.9: impingers and Tedlar bag. Specific VOC destruction efficiencies: Methyl Ethyl Ketone 68%, Toluene 95%, Methyl Isobutyl Ketone 35% (one run <0), C2H5OH 91%, Acetone 60%. No usage rate available for production rate. Analyses of standards and samples transcribed manually for field data. No documentation for sample collection. No documentation of bias on drift checks in sample analysis. All calculations handwritten, but audit OK on finalized data. No certification of traceability on calibration gases.

No field data. No documentation of sample collection or analysis. Acetone 0.60 lb/hour, Isopropyl Alcohol 0.12 lb/hour, Methyl Ethyl Ketone 0.11 lb/hour, Naptha 3.8 lb/hour.

Many pages missing from this copy of report.

B-6

POLLUTANT	TEST	---TEMPERATURE---			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	117	351	n/r	n/r	675	3415.00	160.20	68.375	3.341	95.11	n/r	n/r
THC	2	115	354	n/r	n/r	675	3360.00	154.20	67.199	3.216	95.21	n/r	n/r
THC	3	116	356	n/r	n/r	675	3432.00	153.00	68.792	3.105	95.49	n/r	n/r
AVERAGE											95.27	n/r	n/r
acetone	1	117	351	n/r	n/r	675	1939.00	133.00	38.823	2.774	92.85	n/r	n/r
acetone	2	115	354	n/r	n/r	675	1243.00	121.60	24.860	2.536	89.80	n/r	n/r
acetone	3	116	356	n/r	n/r	675	1918.00	126.00	38.445	2.557	93.35	n/r	n/r
AVERAGE											92.00	n/r	n/r
ethanol	1	117	351	n/r	n/r	675	310.00	1.37	6.207	0.029	99.53	n/r	n/r
ethanol	2	115	354	n/r	n/r	675	307.00	1.14	6.140	0.024	99.61	n/r	n/r
ethanol	3	116	356	n/r	n/r	675	300.00	1.14	6.013	0.023	99.62	n/r	n/r
AVERAGE											99.59	n/r	n/r
ethyl acetate	1	117	351	n/r	n/r	675	3.60	0.64	0.072	0.013	81.94	n/r	n/r
ethyl acetate	2	115	354	n/r	n/r	675	2.00	0.48	0.040	0.010	75.00	n/r	n/r

ethyl acetate	3	116	356	n/r	n/r	675	3.60	0.40	0.072	0.008	88.89	n/r	n/r
---------------	---	-----	-----	-----	-----	-----	------	------	-------	-------	-------	-----	-----

(continued)

PLANT CODE	dfn017	PROCESS TYPE	
FACILITY	Crown Roll Leaf	PROCESS	Rotogravure Printing
ADDRESS		LINE DESIGNATION	
		CONTROL DEVICE	NJStack 005
TEST DATE	Paterson, NJ	TEST METHOD	
AGENCY	08/09/1988	CONTROL TYPE	catalytic incinerator
RATING	NJDEP	CONTROL MANUF	
SCC	C	DATE INSTALLED	n/r
	40201301	DESIGN FLOW (dscfm)	n/r

DESIGN RES TIME (s)	n/r
DESIGN OP TEMP (degF)	n/r
DESIGN EFFIC (%)	n/r
DEMONSTRATED EFF (%)	n/r
FUEL	n/r
SORBENT/CATALYST	n/r
SORB/CAT AGE (yr)	n/r

NOTES NJ Method 3.9: impingers and tedlar bag. Specific VOC destruction efficiencies: Methyl Ethyl Ketone 68%, Toluene 95%, Methyl Isobutyl Ketone 35% (one run <0), C2H5OH 91%, Acetone 60%. No usage rate available for production rate. Analyses of standards and samples transcribed manually for field data. No documentation for sample collection. No documentation of bias on drift checks in sample analysis. All calculations handwritten, but audit OK on finalized data. No certification of traceability on calibration gases.

No field data. No documentation of sample collection or analysis. Acetone 0.60 lb/hour, Isopropyl Alcohol 0.12 lb/hour, Methyl Ethyl Ketone 0.11 lb/hour, Naptha 3.8 lb/hour.

Many pages missing from this copy of report.

B-8

POLLUTANT	TEST	---TEMPERATURE---			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
AVERAGE											81.94	n/r	n/r
methyl ethyl ketone	1	117	351	n/r	n/r	675	418.00	10.10	8.369	0.211	97.48	n/r	n/r
methyl ethyl ketone	2	115	354	n/r	n/r	675	242.00	9.14	4.840	0.191	96.05	n/r	n/r
methyl ethyl ketone	3	116	356	n/r	n/r	675	394.00	8.86	7.897	0.180	97.72	n/r	n/r
AVERAGE											97.08	n/r	n/r
methyl isobutyl keto	1	117	351	n/r	n/r	675	502.00	13.05	10.051	0.272	97.29	n/r	n/r
methyl isobutyl keto	2	115	354	n/r	n/r	675	300.20	12.10	6.004	0.252	95.80	n/r	n/r
methyl isobutyl keto	3	116	356	n/r	n/r	675	525.00	10.23	10.523	0.208	98.02	n/r	n/r
AVERAGE											97.04	n/r	n/r
toluene	1	117	351	n/r	n/r	675	1680.00	12.80	33.637	0.267	99.21	n/r	n/r
toluene	2	115	354	n/r	n/r	675	980.00	9.10	19.600	0.190	99.03	n/r	n/r
toluene	3	116	356	n/r	n/r	675	1823.00	10.50	36.541	0.213	99.42	n/r	n/r
AVERAGE											99.22	n/r	n/r

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	pg6	PROCESS TYPE	printing; flexographic & rotogravure: catalytic incinerator
FACILITY	Graphic Packaging Corporation	PROCESS	rotogravure printing
ADDRESS	Cedar Hollow Rd & Matthews Rd	LINE DESIGNATION	#8 Zerand press
		CONTROL DEVICE	DESIGN RES TIME (s) n/r
	Paoli, PA	TEST METHOD	EPA25
TEST DATE	12/09/1986	CONTROL TYPE	catalytic incinerator
AGENCY	R3	CONTROL MANUF	M & W Industries
RATING	C	DATE INSTALLED	10/01/1986
SCC		DESIGN FLOW (dscfm)	n/r
			DESIGN OP TEMP (degF) n/r
			DESIGN EFFIC (%) n/r
			DEMONSTRATED EFF (%) n/r
			FUEL n/r
			SORBENT/CATALYST magnesium oxide
			SORB/CAT AGE (yr) n/r

NOTES Temperature data not found in data sheets, usage rates for individual runs were missing and the usage rates appear to be average.

Agency is Pennsylvania Dept. of Natural Resources.

POLLUTANT	TEST	---TEMPERATURE---			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
TGNMO	1	100	424	549	n/r	171	5403.00	107.00	67.635	1.554	97.70	73.90	72.2
TGNMO	2	105	424	549	n/r	171	5449.00	129.00	66.517	1.861	97.20	72.68	70.7
TGNMO	3	105	424	549	n/r	171	5575.00	184.00	68.117	2.660	96.09	74.43	71.5
AVERAGE											97.00	73.67	71.5

NOTES:

- Coating contains V-1256, V-31319, L-1616, 86R494, NP Acetate, Ethyl Acetate. Application rates assumed constant for the runs.
Solvent test method: mass balance, 24A, ASTM D 2369-73, ASTM D 3272-76.
Solvent pollutant content is in #C/#coating.
- Solvent test method: mass balance, 24A, ASTM D 2369-73, ASTM D 3272-76.
Solvent pollutant content is in #C/#coating.
- Solvent test method: mass balance, 24A, ASTM D 2369-73, ASTM D 3272-76.
Solvent pollutant content is in #C/#coating.

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	pg4	PROCESS TYPE	Coater
FACILITY	Owens Illinois Closure Inc.	PROCESS	Sheet metal coating oven
ADDRESS	70 Sewell St.	LINE DESIGNATION	T, litho coater line 029
	Glassboro, NJ 08028	CONTROL DEVICE	
TEST DATE	11/18/1987	TEST METHOD	NJ3.
AGENCY	NJDEP	CONTROL TYPE	catalytic incinerator
RATING	B	CONTROL MANUF	
SCC	402xxxxx	DATE INSTALLED	n/r
		DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	n/r
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	N.G./propane
		SORBENT/CATALYST	platinum
		SORB/CAT AGE (yr)	n/r

NOTES There is not sufficient data on how the % Carbon was determined for lacquer.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
ethyl benzene	1	170	833	590	n/r	310	220.00	12.00	2.364	0.147	93.78	15.13	14.2
ethyl benzene	2	168	843	590	n/r	310	230.00	0.63	2.458	0.008	99.67	14.13	14.1
ethyl benzene	3	1690	841	590	n/r	310	251.00	6.40	2.860	0.080	97.20	16.52	16.1
AVERAGE											96.88	15.26	14.8
isophrone	1	170	833	590	n/r	310	117.00	1.44	1.257	0.018	98.57	8.00	7.9
isophrone	2	168	843	590	n/r	310	140.00	0.13	1.496	0.002	99.87	8.06	8.1
isophrone	3	169	841	590	n/r	310	140.00	0.09	1.595	0.001	99.94	9.32	9.3
AVERAGE											99.46	8.46	8.4
NOTES:	2	Outlet concentration average of .088-.168 range given.											
m-xylene	1	170	833	590	n/r	310	460.00	25.00	4.942	0.307	93.79	14.78	13.9
m-xylene	2	168	843	590	n/r	310	461.00	11.00	4.927	0.135	97.26	12.63	12.3
m-xylene	3	169	841	590	n/r	310	512.00	13.00	5.834	0.162	97.22	14.96	14.5
AVERAGE											96.09	14.12	13.6
methyl isobutyl keto	1	170	833	590	n/r	310	286.00	10.39	3.073	0.128	95.83	21.99	21.1
methyl isobutyl keto	2	168	843	590	n/r	310	310.00	2.70	3.313	0.033	99.00	21.88	21.7
methyl isobutyl keto	3	169	841	590	n/r	310	315.00	2.21	3.590	0.028	99.22	22.75	22.6
AVERAGE											98.02	22.21	21.8
NOTES:	2	Outlet concentration average of 3.05-2.34 range given.											
o-xylene	1	170	833	590	n/r	310	168.00	11.00	1.805	0.135	92.52	13.48	12.5
o-xylene	2	168	843	590	n/r	310	170.00	6.30	1.817	0.077	95.76	11.80	11.3
o-xylene	3	169	841	590	n/r	310	191.00	6.70	2.177	0.083	96.19	12.72	12.2
AVERAGE											94.82	12.67	12.0

B-11

(continued)

PLANT CODE	pg4	PROCESS TYPE	Coater		
FACILITY	Owens Illinois Closure Inc.	PROCESS	Sheet metal coating oven		
ADDRESS	70 Sewell St.	LINE DESIGNATION	T, litho coater line 029	DESIGN RES TIME (s)	n/r
		CONTROL DEVICE		DESIGN OP TEMP (degF)	n/r
	Glassboro, NJ 08028	TEST METHOD	NJ3.	DESIGN EFFIC (%)	n/r
TEST DATE	11/18/1987	CONTROL TYPE	catalytic incinerator	DEMONSTRATED EFF (%)	n/r
AGENCY	NJDEP	CONTROL MANUF		FUEL	N.G./propane
RATING	B	DATE INSTALLED	n/r	SORBENT/CATALYST	platinum
SCC	402xxxxx	DESIGN FLOW (dscfm)	n/r	SORB/CAT AGE (yr)	n/r

NOTES There is not sufficient data on how the % Carbon was determined for lacquer.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
p-xylene	1	170	833	590	n/r	310	191.00	11.00	2.052	0.135	93.42	14.15	13.2
p-xylene	2	168	843	590	n/r	310	201.00	4.90	2.148	0.060	97.21	13.18	12.8
p-xylene	3	169	841	590	n/r	310	222.00	6.20	2.530	0.077	96.96	15.40	14.9
AVERAGE											95.86	14.24	13.7

n/a = data is not applicable.
n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn009	PROCESS TYPE	
FACILITY	Pittsburgh Metal Lithographing	PROCESS	metal coating line
ADDRESS	409 Broad Street, Suite 205	LINE DESIGNATION	coating line #1
		CONTROL DEVICE	
TEST DATE	Sewickley, PA 15143	TEST METHOD	EPA25
AGENCY	08/24/1988	CONTROL TYPE	catalytic incinerator
RATING	PaDER	CONTROL MANUF	
SCC	C	DATE INSTALLED	n/r
	40201801	DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	n/r
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	n/r
		SORBENT/CATALYST	n/r
		SORB/CAT AGE (yr)	n/r

NOTES Coating VOC usage rate questionable - capture efficiencies >>100%. No documentation of sampling equations or temperatures. No documentation of sampling temperature. No documentation of leak checks. Plant tested located at Fallsington, PA.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
TGNMO	1	208	469	n/r	n/r	840	128.00	553.00	1.645	8.443	-413.25	2.72	-11.3
TGNMO	2	214	528	n/r	n/r	840	5114.00	465.00	67.608	6.321	90.65	127.32	115.4
TGNMO	3	227	512	n/r	n/r	840	6542.00	470.00	84.050	6.476	92.30	110.88	102.3
AVERAGE											-76.77	80.31	68.8

NOTES:
 1 Delta temp. is measured at the inlet. DRE is approximately 393.
 2 Delta temp. was measured at the inlet.
 3 Delta temp. is measured at the inlet.

n/a = data is not applicable.
 n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	pg5	PROCESS TYPE	metal coating line; catalytic incinerator	
FACILITY	Pittsburgh Metal Lithography	PROCESS	metal coating line	
ADDRESS		LINE DESIGNATION	coating line #2 catalytic inci	DESIGN RES TIME (s) n/r
		CONTROL DEVICE		DESIGN OP TEMP (degF) n/r
	Fallsington, PA	TEST METHOD	EPA25	DESIGN EFFIC (%) n/r
TEST DATE	10/13/1988	CONTROL TYPE	catalytic incinerator	DEMONSTRATED EFF (%) n/r
AGENCY	Reg.3	CONTROL MANUF		FUEL n/r
RATING	B	DATE INSTALLED	n/r	SORBENT/CATALYST n/r
SCC	40201801	DESIGN FLOW (dscfm)	n/r	SORB/CAT AGE (yr) n/r

NOTES VOC used found by change in weight of solvent and coating plus the change in weight of scraper drum along with scraper drum concentration. Pgs. 13-70 seem to be missing. It is unclear whether there is a catalyst and no delta T info. is included. Methods for determining moisture, velocity, fluoride, temperature not temperature.

Process description: metal coating line, solvent and coating mixed.

POLLUTANT	TEST	---TEMPERATURE---			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
TGNMO	1	223	913	n/r	n/r	n/r	6601.00	180.00	64.343	1.698	97.36	98.57	96.0
TGNMO	2	224	950	n/r	n/r	n/r	4090.00	64.00	39.723	0.576	98.55	77.23	76.1
TGNMO	3	232	910	n/r	n/r	n/r	4255.00	68.00	42.284	0.611	98.56	81.81	80.6
AVERAGE											98.16	85.87	84.2

NOTES:
 1 Solvent pollutant content is in #C/#solvent.
 2 Solvent pollutant content is in #C/(#solvent + lacquer).
 3 Solvent pollutant content is in #C/#solvent.

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn008	PROCESS TYPE	vinyl film coating
FACILITY	Roysons, Inc.	PROCESS	rotogravure printing
ADDRESS	40 Van der Hoof Ave.	LINE DESIGNATION	3 u l and 1 stock color print
		CONTROL DEVICE	NJ Stack002
	Rockaway, NJ 07866	TEST METHOD	NJAT Method 3.7
TEST DATE	12/11/1990	CONTROL TYPE	catalytic incinerator
AGENCY	NJDEP	CONTROL MANUF	EDA
RATING	C	DATE INSTALLED	n/r
SCC	40500511	DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	n/r
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	n/r
		SORBENT/CATALYST	n/r
		SORB/CAT AGE (yr)	n/r

NOTES Methyl isobutyl ketone 3.84 lb/hour-61.9 lb/ton; methyl ethyl ketone 79.4 lb/hour-1,280 lb/ton; acetone 0.43 lb/hour; 6.93 lb/ton; toluene 6.70 lb/hour-108 lb/ton; Are "C". No documentation of field data. No calibration gases certifications. Capture efficiency of 94.29% reported, but not documented.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	59	231	n/r	n/r	1	1556.00	35.30	32.609	0.905	97.22	n/r	n/r
THC	2	62	233	n/r	n/r	1	1516.00	35.30	31.793	0.929	97.08	n/r	n/r
THC	3	62	235	n/r	n/r	1	1518.00	30.30	31.801	0.745	97.66	n/r	n/r
AVERAGE											97.32	n/r	n/r

NOTES: 1 Capture efficiency calculated from sorbent usage and sum (methyl ethyl ketone, methyl isobutyl ketone, acetone, toluene) inlet emission rates.

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn011	PROCESS TYPE	curtain coating - nitrocellulose lacquer	
FACILITY	Transco Products Corporation	PROCESS	metal parts coating	
ADDRESS	609 West Elizabeth Avenue	LINE DESIGNATION	NJ Stack No. 001	DESIGN RES TIME (s) n/r
		CONTROL DEVICE		DESIGN OP TEMP (degF) 600
TEST DATE	Linden, NJ 07036	TEST METHOD		DESIGN EFFIC (%) n/r
	06/17/1991	CONTROL TYPE	catalytic incinerator	DEMONSTRATED EFF (%) n/r
AGENCY	NJDEP	CONTROL MANUF		FUEL natural gas
RATING	C	DATE INSTALLED	n/r	SORBENT/CATALYST platinum impreg
SCC	402xxxxx	DESIGN FLOW (dscfm)	n/r	SORB/CAT AGE (yr) n/r

NOTES No documentation of sample collection procedure used; method 5 procedures photocopied into report. TOC ER 20.6 lb/hour, EF 1916 lb/ton; Butyl Acetate ER 0.06 lb/hour, EF 6 lb/ton; Toluene ER 0.11 lb/hour, EF 9.8 lb/ton; Methyl Ethyl Ketone ER 1.44 lb/hour, EF 134 lb/ton, Ethanol ER 0.62 lb/hour, EF 58 lb/ton. No method 1 documentation of flow/stream analysis. Strip charts not labeled; no system checks documented. No documentation of calibration gases.

Monitoring devices were installed: carbon monoxide, oxygen, CEMs, pre- and post-catalyst temperature. Design gas flow rate was 1500 cfm/900 cfm::2 room/1 room operating. Design operating temperature was taken at catalyst inlet. Sorbent/Catalyst was platinum impregnated.

B-17

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	87	275	n/r	n/r	n/r	48800.00	1552.00	89.593	2.797	96.88	n/r	n/r
THC	2	88	270	n/r	n/r	n/r	37694.00	1647.00	74.397	3.094	95.84	n/r	n/r
THC	3	82	272	n/r	n/r	n/r	45385.00	2004.00	88.732	3.634	95.90	n/r	n/r
AVERAGE											96.21	n/r	n/r
butyl acetate	1	87	275	n/r	n/r	n/r	20.20	0.00	0.037	0.000	100.00	3.23	3.2
butyl acetate	2	88	270	n/r	n/r	n/r	18.80	0.00	0.037	0.000	100.00	3.23	3.2
butyl acetate	3	82	272	n/r	n/r	n/r	19.50	0.00	0.038	0.000	100.00	3.31	3.3
AVERAGE											100.00	3.26	3.3
NOTES:		1	1.148 #C/h usage. Concentration calculated from emission rate. Solvent pollutant content in #C/#. Outlet concentration is <4.2. Outlet emission rate is <0.0076. DRE is <79.5.										
		2	Concentration calculated from emission rate. Solvent pollutant content is in #C/#. Outlet concentration is <4.2. Outlet emission rate is <0.0078. DRE is >79.										
		3	Concentration calculated from emission rate. Solvent pollutant content in #C/#. Outlet concentration is <3.9. Outlet emission rate is <0.007. DRE is >81.8.										
ethanol	1	87	275	n/r	n/r	n/r	83.50	0.00	0.153	0.000	100.00	5.28	5.3
ethanol	2	88	270	n/r	n/r	n/r	228.00	0.00	0.450	0.000	100.00	15.54	15.5
ethanol	3	82	272	n/r	n/r	n/r	190.00	0.00	0.371	0.000	100.00	12.81	12.8
AVERAGE											100.00	11.21	11.2

NOTES:

- 1 2.896 #C/h usage. Concentration calculated from emission rate. Solvent pollutant content is in #C/#. Outlet concentration is <3.6. Outlet emission rate is <0.0064. DRE is >95.8.

(continued)

PLANT CODE	dfn011	PROCESS TYPE	curtain coating - nitrocellulose lacquer	
FACILITY	Transco Products Corporation	PROCESS	metal parts coating	
ADDRESS	609 West Elizabeth Avenue	LINE DESIGNATION	NJ Stack No. 001	DESIGN RES TIME (s) n/r
		CONTROL DEVICE		DESIGN OP TEMP (degF) 600
TEST DATE	Linden, NJ 07036	TEST METHOD		DESIGN EFFIC (%) n/r
	06/17/1991	CONTROL TYPE	catalytic incinerator	DEMONSTRATED EFF (%) n/r
AGENCY	NJDEP	CONTROL MANUF		FUEL natural gas
RATING	C	DATE INSTALLED	n/r	SORBENT/CATALYST platinum impreg
SCC	402xxxxx	DESIGN FLOW (dscfm)	n/r	SORB/CAT AGE (yr) n/r

NOTES No documentation of sample collection procedure used; method 5 procedures photocopied into report. TOC ER 20.6 lb/hour, EF 1916 lb/ton; Butyl Acetate ER 0.06 lb/hour, EF 6 lb/ton; Toluene ER 0.11 lb/hour, EF 9.8 lb/ton; Methyl Ethyl Ketone ER 1.44 lb/hour, EF 134 lb/ton, Ethanol ER 0.62 lb/hour, EF 58 lb/ton. No method 1 documentation of flow/stream analysis. Strip charts not labeled; no system checks documented. No documentation of calibration gases.

Monitoring devices were installed: carbon monoxide, oxygen, CEMs, pre- and post-catalyst temperature. Design gas flow rate was 1500 cfm/900 cfm::2 room/1 room operating. Design operating temperature was taken at catalyst inlet. Sorbent/Catalyst was platinum impregnated.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		CAPTURE DRE	EFFIC	OVERALL CONTROL EFFECT
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
	2	2.896 #C/h usage. Concentration calculated from emission rate. Solvent pollutant content is in #C/#. Outlet concentration is <3.5. Outlet emission rate is <0.0066. DRE is >98.5.											
	3	2.896 #C/h usage. Concentration calculated from emission rate. Solvent pollutant content is in #C/#. Outlet concentration is <3.3. Outlet emission rate is <0.0059. DRE is >98.4.											
ethyl acetate	1	87	275	n/r	n/r	n/r	0.00	0.00	n/r	0.000	n/r	n/r	n/r
ethyl acetate	2	88	270	n/r	n/r	n/r	0.00	0.00	n/r	0.000	n/r	n/r	n/r
ethyl acetate	3	82	272	n/r	n/r	n/r	0.00	0.00	n/r	0.000	n/r	n/r	n/r
AVERAGE											n/r	n/r	n/r
NOTES:	1	1.615 #C/h usage. Concentration calculated from emission rate. Solvent pollutant content in #C/#. Inlet and outlet concentrations are <3.3 and <3.7, respectively. Inlet and outlet emission rates are <0.006 and <0.0067, respectively.											
	2	Concentration calculated from emission rate. Solvent pollutant content is in #C/#. Inlet and outlet concentrations are <3.3 and <3.7 respectively. Inlet and outlet emission rates are <0.0065 and <0.0069, respectively.											
	3	Concentration calculated from emission rate. Solvent pollutant content is in #C/#. Inlet and outlet concentrations are <3.6 and <3.4, respectively. Inlet and outlet emission rates are <0.0071 and <0.0062, respectively.											
methyl ethyl ketone	1	87	275	n/r	n/r	n/r	518.00	0.00	0.951	0.000	100.00	15.39	15.4
methyl ethyl ketone	2	88	270	n/r	n/r	n/r	477.00	0.00	0.941	0.000	100.00	15.23	15.2

B-19

methyl ethyl ketone	3	82	272	n/r	n/r	n/r	507.00	0.00	0.991	0.000	100.00	16.04	16.0
---------------------	---	----	-----	-----	-----	-----	--------	------	-------	-------	--------	-------	------

(continued)

PLANT CODE	dfn011	PROCESS TYPE	curtain coating - nitrocellulose lacquer		
FACILITY	Transco Products Corporation	PROCESS	metal parts coating		
ADDRESS	609 West Elizabeth Avenue	LINE DESIGNATION	NJ Stack No. 001	DESIGN RES TIME (s)	n/r
		CONTROL DEVICE		DESIGN OP TEMP (degF)	600
TEST DATE	Linden, NJ 07036	TEST METHOD		DESIGN EFFIC (%)	n/r
AGENCY	06/17/1991	CONTROL TYPE	catalytic incinerator	DEMONSTRATED EFF (%)	n/r
RATING	NJDEP	CONTROL MANUF		FUEL	natural gas
SCC	C	DATE INSTALLED	n/r	SORBENT/CATALYST	platinum impreg
	402xxxxx	DESIGN FLOW (dscfm)	n/r	SORB/CAT AGE (yr)	n/r

NOTES No documentation of sample collection procedure used; method 5 procedures photocopied into report. TOC ER 20.6 lb/hour, EF 1916 lb/ton; Butyl Acetate ER 0.06 lb/hour, EF 6 lb/ton; Toluene ER 0.11 lb/hour, EF 9.8 lb/ton; Methyl Ethyl Ketone ER 1.44 lb/hour, EF 134 lb/ton, Ethanol ER 0.62 lb/hour, EF 58 lb/ton. No method 1 documentation of flow/stream analysis. Strip charts not labeled; no system checks documented. No documentation of calibration gases.

Monitoring devices were installed: carbon monoxide, oxygen, CEMs, pre- and post-catalyst temperature. Design gas flow rate was 1500 cfm/900 cfm::2 room/1 room operating. Design operating temperature was taken at catalyst inlet. Sorbent/Catalyst was platinum impregnated.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		CAPTURE DRE	CONTROL EFFIC	OVERALL CONTROL EFFECT
		INLET deg F	OUTLET deg F	OPER deg F			s	deg F	INLET ppmv C	OUTLET ppmv C			
AVERAGE											100.00	15.55	15.6
NOTES:	1	6.17 #C/h usage rate. Concentration calculated from emission rate. Solvent pollutant content is in #C/#. Outlet concentration is <4.6. Outlet emission rate is <0.0082. DRE is >99.											
	2	Concentration calculated from emission rate. Solvent pollutant content is in #C/#. Outlet concentration is <4.5. Outlet emission rate is <0.0084. DRE is >99.											
	3	Concentration calculated from emission rate. Solvent pollutant content in #C/#. Outlet concentration is <4.1. Outlet emission rate is <0.0075. DRE is >99.											
toluene	1	87	275	n/r	n/r	n/r	54.60	0.00	0.100	0.000	100.00	5.91	5.9
toluene	2	88	270	n/r	n/r	n/r	48.20	0.00	0.095	0.000	100.00	5.62	5.6
toluene	3	82	272	n/r	n/r	n/r	47.10	0.00	0.092	0.000	100.00	5.44	5.4
AVERAGE											100.00	5.66	5.7

NOTES: 1 1.689 #C/h usage. Concentration calculated from emission rate. Solvent pollutant content in #C/#. Outlet concentration <6.2. Outlet emission rate <0.0112. DRE >88.8.
 2 Concentration calculated from emission rate. Solvent pollutant content in #C/#. Outlet concentration is <6.1. Outlet emission rate is <0.0115. DRE is >87.9.
 3 Concentration calculated from emission rate. Solvent pollutant content in #C/#. Outlet concentration is <5.7. Outlet emission rate is <0.0103. DRE is >88.8.

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	pg9	PROCESS TYPE	
FACILITY	Unifoil Corp	PROCESS	3 laminators
ADDRESS	217 Brook Avenue	LINE DESIGNATION	
	Passaic, NJ 07055	CONTROL DEVICE	Cat. Incin.
TEST DATE	02/25/1992	TEST METHOD	NJ3.
AGENCY	NJDEP	CONTROL TYPE	catalytic incinerator
RATING	A	CONTROL MANUF	Eclipse Combustion
SCC	402900xx	DATE INSTALLED	n/r
		DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	850
		DESIGN EFFIC (%)	95.00
		DEMONSTRATED EFF (%)	n/r
		FUEL	natural gas
		SORBENT/CATALYST	n/r
		SORB/CAT AGE (yr)	n/r

NOTES No solvent usage data.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	362	632	n/r	n/r	275	9300.00	61.00	228.577	1.601	99.30	100.00	0.0
THC	3	346	618	n/r	n/r	285	9500.00	68.00	226.418	1.823	99.19	100.00	0.0
THC	4	337	609	n/r	n/r	150	9100.00	62.00	235.523	1.674	99.29	100.00	0.0
	AVERAGE										99.26	100.00	0.0

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	cs006	PROCESS TYPE	catalytic afterburner/laminator
FACILITY	Unifoil Corporation	PROCESS	3 laminators
ADDRESS	217 Brook Avenue	LINE DESIGNATION	lines 1,3,4
		CONTROL DEVICE	NJStack 001
TEST DATE	Passaic, NJ 07055	TEST METHOD	NJ3.9
AGENCY	11/10/1987	CONTROL TYPE	catalytic incinerator
RATING	NJDEP	CONTROL MANUF	eclipse combustion
SCC	402900xx	DATE INSTALLED	n/r
		DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	3.270
		DESIGN OP TEMP (degF)	850
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	natural gas
		SORBENT/CATALYST	"Torvex"
		SORB/CAT AGE (yr)	n/r

NOTES Solvent usage rates questionable. Design residence time is in seconds. Sorbent/catalyst type is "Torvex" precious metal-ceramic honeycomb.

POLLUTANT	TEST	---TEMPERATURE---			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	494	578	n/r	n/r	n/r	11220.00	262.00	219.361	5.122	97.67	n/r	n/r
THC	2	451	554	n/r	n/r	n/r	7920.00	449.00	163.691	9.113	94.43	n/r	n/r
THC	3	455	566	n/r	n/r	n/r	95400.00	535.00	1971.732	10.659	99.46	n/r	n/r
AVERAGE											97.19	n/r	n/r
acetone	1	494	578	n/r	n/r	n/r	191.40	15.36	3.742	0.300	91.98	n/r	n/r
acetone	2	451	554	n/r	n/r	n/r	108.30	11.80	2.238	0.239	89.32	n/r	n/r
acetone	3	455	566	n/r	n/r	n/r	135.90	12.60	2.809	0.251	91.06	n/r	n/r
AVERAGE											90.79	n/r	n/r
ethanol	1	494	578	n/r	n/r	n/r	762.00	17.50	14.898	0.342	97.70	n/r	n/r
ethanol	2	451	554	n/r	n/r	n/r	400.00	16.80	8.267	0.341	95.88	n/r	n/r
ethanol	3	455	566	n/r	n/r	n/r	596.00	23.60	12.318	0.470	96.18	n/r	n/r
AVERAGE											96.59	n/r	n/r
ethyl acetate	1	494	578	n/r	n/r	n/r	4.24	9.30	0.083	0.182	-119.28	n/r	n/r
ethyl acetate	2	451	554	n/r	n/r	n/r	0.00	3.50	n/r	0.071	n/r	n/r	n/r
ethyl acetate	3	455	566	n/r	n/r	n/r	0.00	3.90	n/r	0.078	n/r	n/r	n/r
AVERAGE											n/r	n/r	n/r
NOTES:	2	Inlet concentration: ND-0.											
	3	Inlet concentration is ND = 0.											
isopropanol	1	494	578	n/r	n/r	n/r	122.70	3.60	2.399	0.070	97.08	n/r	n/r
isopropanol	2	451	554	n/r	n/r	n/r	65.70	9.12	1.358	0.185	86.38	n/r	n/r
isopropanol	3	455	566	n/r	n/r	n/r	96.30	5.49	1.990	0.109	94.52	n/r	n/r

B-24

AVERAGE

92.66

n/r

n/r

(continued)

PLANT CODE	cs006	PROCESS TYPE	catalytic afterburner/laminator
FACILITY	Unifoil Corporation	PROCESS	3 laminators
ADDRESS	217 Brook Avenue	LINE DESIGNATION	lines 1,3,4
		CONTROL DEVICE	NJStack 001
	Passaic, NJ 07055	TEST METHOD	NJ3.9
TEST DATE	11/10/1987	CONTROL TYPE	catalytic incinerator
AGENCY	NJDEP	CONTROL MANUF	eclipse combustion
RATING	C	DATE INSTALLED	n/r
SCC	402900xx	DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	3.270
		DESIGN OP TEMP (degF)	850
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	natural gas
		SORBENT/CATALYST	"Torvex"
		SORB/CAT AGE (yr)	n/r

NOTES Solvent usage rates questionable. Design residence time is in seconds. Sorbent/catalyst type is "Torvex" precious metal-ceramic honeycomb.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
isopropyl acetate	1	494	578	n/r	n/r	n/r	740.00	0.00	14.468	0.000	100.00	n/r	n/r
isopropyl acetate	2	451	554	n/r	n/r	n/r	550.00	6.20	11.367	0.126	98.89	n/r	n/r
AVERAGE											99.45	n/r	n/r
NOTES:	1	Outlet concentration is ND = 0.											
isopropyl acetate	3	455	566	n/r	n/r	n/r	725.00	7.40	14.984	0.147	99.02	n/r	n/r
AVERAGE											99.02	n/r	n/r
methyl ethyl ketone	1	494	578	n/r	n/r	n/r	3008.00	91.20	58.809	1.783	96.97	n/r	n/r
methyl ethyl ketone	2	451	554	n/r	n/r	n/r	3364.00	177.00	69.527	3.592	94.83	n/r	n/r
methyl ethyl ketone	3	455	566	n/r	n/r	n/r	3976.00	182.00	82.176	3.626	95.59	n/r	n/r
AVERAGE											95.80	n/r	n/r
methyl isobutyl keto	1	494	578	n/r	n/r	n/r	57.80	3.06	1.130	0.060	94.69	n/r	n/r
methyl isobutyl keto	2	451	554	n/r	n/r	n/r	3.20	5.97	0.066	0.121	-83.33	n/r	n/r
methyl isobutyl keto	3	455	566	n/r	n/r	n/r	50.30	5.40	1.040	0.108	89.62	n/r	n/r
AVERAGE											33.66	n/r	n/r
toluene	1	494	578	n/r	n/r	n/r	9100.00	910.00	177.913	17.791	90.00	n/r	n/r
toluene	2	451	554	n/r	n/r	n/r	9100.00	700.00	188.079	14.207	92.45	n/r	n/r
toluene	3	455	566	n/r	n/r	n/r	11200.00	770.00	231.482	15.341	93.37	n/r	n/r
AVERAGE											91.94	n/r	n/r

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	cs004	PROCESS TYPE	Rotogravure Press
FACILITY	Union Camp Corporation	PROCESS	Paper Coating
ADDRESS	One Colour Place	LINE DESIGNATION	7-color sheet fed rotogravure
	Englewood, NJ 07631	CONTROL DEVICE	NJStack 005
TEST DATE	05/24/1988	TEST METHOD	EPA25A
AGENCY	NJDEP	CONTROL TYPE	catalytic incinerator
RATING	A	CONTROL MANUF	
SCC	40201301	DATE INSTALLED	n/r
		DESIGN FLOW (dscfm)	n/r

DESIGN RES TIME (s)	n/r
DESIGN OP TEMP (degF)	n/r
DESIGN EFFIC (%)	n/r
DEMONSTRATED EFF (%)	n/r
FUEL	n/r
SORBENT/CATALYST	n/r
SORB/CAT AGE (yr)	n/r

NOTES Major solvent n-butyl acetate, but other compounds were not quantified.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	90	442	690	n/r	n/r	8760.00	15.00	114.666	0.202	99.82	n/r	n/r
THC	2	95	442	650	n/r	n/r	9360.00	25.20	126.180	0.349	99.72	n/r	n/r
THC	3	96	427	635	n/r	n/r	10440.00	31.80	142.683	0.454	99.68	n/r	n/r
AVERAGE											99.74	n/r	n/r

NOTES:

- 1 Calibrated with n-butyl acetate.
- 2 Calibrated with n-butyl acetate. Incinerator went down halfway through test.
- 3 Calibrated with n-butyl acetate.

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn010	PROCESS TYPE	
FACILITY	Evans Cooperage of Houston	PROCESS	barrel spray paint booth
ADDRESS	10521 Sheldon Road	LINE DESIGNATION	
		CONTROL DEVICE	
	Houston, TX 77044	TEST METHOD	EPA25A
TEST DATE	06/18/1988	CONTROL TYPE	incinerator
AGENCY	TACB	CONTROL MANUF	
RATING	C	DATE INSTALLED	n/r
SCC	40290013	DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	n/r
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	n/r
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES No calculations of finalized data. No certification of calibration gases. Inlet not tested.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	n/r	579	n/r	n/r	n/a	0.00	1180.00	n/r	3.805	n/r	n/r	n/r
THC	2	n/r	587	n/r	n/r	n/a	0.00	527.00	n/r	1.918	n/r	n/r	n/r
THC	3	n/r	569	n/r	n/r	n/a	0.00	445.00	n/r	1.642	n/r	n/r	n/r
	AVERAGE										n/r	n/r	n/r

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	pg10	PROCESS TYPE	Coated Glass fiber type
FACILITY	3M Company	PROCESS	Electrical Tape Man.
ADDRESS	225 Willowbrook Rd.	LINE DESIGNATION	33 coater and 36 tower
		CONTROL DEVICE	
TEST DATE	Freehold, NJ	TEST METHOD	NJ 3.7, 3.8
AGENCY	08/08/1990	CONTROL TYPE	thermal incinerator
RATING	NJDEP	CONTROL MANUF	
SCC	A	DATE INSTALLED	n/r
	40200701	DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	n/r
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	natural gas
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES Applied VOC reported as #VOC/h - no analysis of applied solvent.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
ethyl acetate	1a	148	756	1500	n/r	n/a	797.00	0.00	19.700	0.000	100.00	n/r	n/r
ethyl acetate	1b	148	738	1500	n/r	n/a	874.00	0.00	20.280	0.000	100.00	n/r	n/r
ethyl acetate	1c	149	735	1500	n/r	n/a	863.00	0.00	19.635	0.000	100.00	n/r	n/r
ethyl acetate	2a	149	591	1400	n/r	n/a	872.00	0.00	18.802	0.000	100.00	n/r	n/r
ethyl acetate	2b	150	597	1400	n/r	n/a	835.00	0.00	19.248	0.000	100.00	n/r	n/r
ethyl acetate	2c	148	608	1400	n/r	n/a	787.00	0.00	19.185	0.000	100.00	n/r	n/r
ethyl acetate	3a	133	622	1500	n/r	n/a	838.00	0.00	18.439	0.000	100.00	n/r	n/r
ethyl acetate	3b	130	612	1500	n/r	n/a	914.00	0.00	18.058	0.000	100.00	n/r	n/r
ethyl acetate	3c	137	610	1500	n/r	n/a	917.00	0.00	19.304	0.000	100.00	n/r	n/r
AVERAGE											100.00	n/r	n/r

NOTES:

- 1a Outlet concentration is <1.
- 1b Outlet concentration is <1.
- 1c Outlet concentration is <1.
- 2a Outlet concentration is <1.
- 2b Outlet concentration is <1.
- 2c Outlet concentration is <1.
- 3a Outlet concentration is <1.
- 3b Outlet concentration is <1.
- 3c Outlet concentration is <1.

toluene	1a	148	756	1500	n/r	n/a	235.00	21.90	5.809	0.482	91.70	n/r	n/r
toluene	1b	148	738	1500	n/r	n/a	211.00	19.10	4.896	0.413	91.56	n/r	n/r
toluene	1c	149	735	1500	n/r	n/a	207.00	18.50	4.710	0.369	92.17	n/r	n/r
toluene	2a	149	591	1400	n/r	n/a	218.00	19.80	4.700	0.440	90.64	n/r	n/r
toluene	2b	150	597	1400	n/r	n/a	224.00	20.30	5.164	0.459	91.11	n/r	n/r
toluene	2c	148	608	1400	n/r	n/a	238.00	21.00	5.802	0.510	91.21	n/r	n/r
toluene	3a	133	622	1500	n/r	n/a	58.40	11.50	1.285	0.254	80.23	n/r	n/r
toluene	3b	130	612	1500	n/r	n/a	60.50	11.10	1.195	0.235	80.33	n/r	n/r
toluene	3c	137	610	1500	n/r	n/a	61.50	10.90	1.295	0.203	84.32	n/r	n/r
toluene	4a	132	545	1500	n/r	n/a	432.00	0.00	5.862	0.000	100.00	n/r	n/r

B-30

toluene	4b	116	523	1500	n/r	n/a	403.00	0.00	5.662	0.000	100.00	n/r	n/r
---------	----	-----	-----	------	-----	-----	--------	------	-------	-------	--------	-----	-----

(continued)

PLANT CODE	pg10	PROCESS TYPE	Coated Glass fiber type
FACILITY	3M Company	PROCESS	Electrical Tape Man.
ADDRESS	225 Willowbrook Rd.	LINE DESIGNATION	33 coater and 36 tower
		CONTROL DEVICE	
TEST DATE	Freehold, NJ	TEST METHOD	NJ 3.7, 3.8
AGENCY	08/08/1990	CONTROL TYPE	thermal incinerator
RATING	NJDEP	CONTROL MANUF	
SCC	A	DATE INSTALLED	n/r
	40200701	DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	n/r
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	natural gas
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES Applied VOC reported as #VOC/h - no analysis of applied solvent.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
toluene	4c	125	539	n/r	n/r	n/a	432.00	0.00	5.892	0.000	100.00	n/r	n/r
AVERAGE											91.11	n/r	n/r
NOTES:	4a	Outlet concentration is <1.											
	4b	Outlet concentration is <1.											
	4c	Outlet concentration is <1.											
xylene	1a	148	756	1500	n/r	n/a	9.10	0.00	0.225	0.000	100.00	n/r	n/r
xylene	1b	148	738	1500	n/r	n/a	11.10	2.80	0.258	0.061	76.36	n/r	n/r
xylene	1c	149	735	1500	n/r	n/a	10.00	0.00	0.228	0.000	100.00	n/r	n/r
xylene	2a	149	591	1400	n/r	n/a	11.80	0.00	0.254	0.000	100.00	n/r	n/r
xylene	2b	150	597	1400	n/r	n/a	10.40	0.00	0.240	0.000	100.00	n/r	n/r
xylene	2c	148	608	1400	n/r	n/a	9.20	0.00	0.224	0.000	100.00	n/r	n/r
xylene	3a	133	622	1500	n/r	n/a	14.40	0.00	0.317	0.000	100.00	n/r	n/r
xylene	3b	130	612	1500	n/r	n/a	14.50	0.00	0.286	0.000	100.00	n/r	n/r
xylene	3c	137	610	1500	n/r	n/a	15.30	0.00	0.322	0.000	100.00	n/r	n/r
xylene	4a	132	545	1500	n/r	n/a	0.00	0.00	n/r	0.000	n/r	n/r	n/r
xylene	4b	116	523	1500	n/r	n/a	0.00	0.00	n/r	0.000	n/r	n/r	n/r
xylene	4c	125	539	n/r	n/r	n/a	0.00	0.00	n/r	0.000	n/r	n/r	n/r
AVERAGE											n/r	n/r	n/r

NOTES:

- 1a Outlet concentration is <1.5.
- 1c Outlet concentration is <1.
- 2a Outlet concentration is <1.
- 2b Outlet concentration is <1.
- 2c Outlet concentration is <1.
- 3a Outlet concentration is <1.
- 3b Outlet concentration is <1.
- 3c Outlet concentration is <1.
- 4a Inlet and outlet concentrations are both <1.

4b Inlet and outlet concentrations are both <1.

(continued)

PLANT CODE	pg10	PROCESS TYPE	Coated Glass fiber type		
FACILITY	3M Company	PROCESS	Electrical Tape Man.		
ADDRESS	225 Willowbrook Rd.	LINE DESIGNATION	33 coater and 36 tower	DESIGN RES TIME (s)	n/r
		CONTROL DEVICE		DESIGN OP TEMP (degF)	n/r
TEST DATE	Freehold, NJ	TEST METHOD	NJ 3.7, 3.8	DESIGN EFFIC (%)	n/r
AGENCY	08/08/1990	CONTROL TYPE	thermal incinerator	DEMONSTRATED EFF (%)	n/r
RATING	NJDEP	CONTROL MANUF		FUEL	natural gas
SCC	A	DATE INSTALLED	n/r	SORBENT/CATALYST	n/a
	40200701	DESIGN FLOW (dscfm)	n/r	SORB/CAT AGE (yr)	n/a

NOTES Applied VOC reported as #VOC/h - no analysis of applied solvent.

POLLUTANT	----TEMPERATURE----			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %	
	TEST	INLET	OUTLET			OPER	INLET	OUTLET	INLET				OUTLET
		deg F	deg F	deg F	s	deg F	ppmv C	ppmv C	#C/h	#C/h			

4c Inlet and outlet concentrations are both <1.

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	pg10	PROCESS TYPE	Coated Glass fiber type
FACILITY	3M Company	PROCESS	Electrical Tape Man.
ADDRESS	225 Willowbrook Rd.	LINE DESIGNATION	33 coater and 36 tower
		CONTROL DEVICE	
TEST DATE	Freehold, NJ	TEST METHOD	NJ3.7
AGENCY	08/08/1990	CONTROL TYPE	thermal incinerator
RATING	NJDEP	CONTROL MANUF	
SCC	40200701	DATE INSTALLED	n/r
		DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	n/r
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	natural gas
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES Applied VOC reported as #VOC/h - no analysis of applied solvent.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1a	148	756	1500	n/r	n/a	7217.00	92.10	178.389	2.025	98.86	n/r	n/r
THC	1b	148	738	1500	n/r	n/a	7627.00	84.80	176.977	1.835	98.96	n/r	n/r
THC	1c	149	735	1500	n/r	n/a	7963.00	83.70	181.171	1.668	99.08	n/r	n/r
THC	2a	149	591	1400	n/r	n/a	7797.00	194.00	168.117	4.313	97.43	n/r	n/r
THC	2b	150	597	1400	n/r	n/a	7621.00	210.00	175.675	4.747	97.30	n/r	n/r
THC	2c	148	608	1400	n/r	n/a	7421.00	202.00	1808.778	4.910	99.73	n/r	n/r
THC	3a	133	622	1500	n/r	n/a	6422.00	69.50	141.304	1.533	98.92	n/r	n/r
THC	3b	130	612	1500	n/r	n/a	6713.00	73.80	132.632	1.562	98.82	n/r	n/r
THC	3c	137	610	1500	n/r	n/a	6988.00	66.60	147.109	1.239	99.16	n/r	n/r
THC	4a	132	545	1500	n/r	n/a	7199.00	44.20	97.678	0.670	99.31	n/r	n/r
THC	4b	116	523	1500	n/r	n/a	7395.00	41.30	103.890	0.687	99.34	n/r	n/r
THC	4c	125	539	1500	n/r	n/a	7524.00	40.90	102.620	0.660	99.36	n/r	n/r
AVERAGE											98.86	n/r	n/r

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	pg10	PROCESS TYPE	Coated Glass fiber type
FACILITY	3M Company	PROCESS	Electrical Tape Man.
ADDRESS	225 Willowbrook Rd.	LINE DESIGNATION	33 coater and 36 tower
		CONTROL DEVICE	
TEST DATE	Freehold, NJ	TEST METHOD	NJ3.8
AGENCY	08/08/1990	CONTROL TYPE	thermal incinerator
RATING	NJDEP	CONTROL MANUF	
SCC	A	DATE INSTALLED	n/r
	40200701	DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	n/r
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	natural gas
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES Applied VOC reported as #VOC/h - no analysis of applied solvent.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
heptane	1a	148	756	1500	n/r	n/a	97.80	1.00	2.417	0.022	99.09	n/r	n/r
heptane	1a	149	591	1500	n/r	n/a	107.00	1.00	2.307	0.022	99.05	n/r	n/r
heptane	1b	148	738	1500	n/r	n/a	101.00	1.00	2.344	0.022	99.06	n/r	n/r
heptane	1c	149	735	1500	n/r	n/a	107.00	1.00	2.434	0.020	99.18	n/r	n/r
heptane	2b	150	597	1400	n/r	n/a	103.00	1.20	2.374	0.027	98.86	n/r	n/r
heptane	2c	148	608	1400	n/r	n/a	98.80	1.00	2.408	0.024	99.00	n/r	n/r
heptane	3a	133	622	1500	n/r	n/a	99.00	1.00	2.178	0.022	98.99	n/r	n/r
heptane	3b	130	612	1500	n/r	n/a	105.00	1.00	2.075	0.021	98.99	n/r	n/r
heptane	3c	137	610	1500	n/r	n/a	105.00	1.00	2.210	0.019	99.14	n/r	n/r
AVERAGE											99.04	n/r	n/r

NOTES:

- 1a Outlet concentration <1 ppm.
- 1a Outlet concentration <1 ppm.
- 1b Outlet concentration <1 ppm.
- 1c Outlet concentration <1 ppm.
- 2c Outlet concentration <1 ppm.
- 3a Outlet concentration <1 ppm.
- 3b Outlet Concentration <1 ppm.
- 3c Outlet Concentration <1 ppm.

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	cs005	PROCESS TYPE	rotogravure presses thermal oxidizers
FACILITY	Advanced Printing Technology	PROCESS	rotogravure presses
ADDRESS	P.O. Box 470	LINE DESIGNATION	
		CONTROL DEVICE	DESIGN RES TIME (s) n/r
	Morgantown, PA 19543-0470	TEST METHOD	DESIGN OP TEMP (degF) 1500
TEST DATE	06/29/1989	CONTROL TYPE	DESIGN EFFIC (%) 99.00
AGENCY	PaDER	CONTROL MANUF	DEMONSTRATED EFF (%) n/r
RATING	A	DATE INSTALLED	FUEL n/r
SCC	40500511	DESIGN FLOW (dscfm)	SORBENT/CATALYST n/a
			SORB/CAT AGE (yr) n/a

NOTES Thermal incinerator has a heat recovery system.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	152	325	n/r	n/r	n/a	7311.60	47.40	1340.989	7.228	99.46	n/r	n/r
THC	2	150	320	n/r	n/r	n/a	7202.40	66.90	1180.148	11.161	99.05	n/r	n/r
THC	3	152	307	n/r	n/r	n/a	7569.00	51.90	1262.767	7.895	99.37	n/r	n/r
	AVERAGE										99.29	n/r	n/r

- NOTES:
- 1 Insufficient data to determine total enclosure. Inlet flow > outlet flow.
 - 2 Insufficient data to determine total enclosure.
 - 3 Insufficient data to determine total enclosure. Inlet flow > outlet flow.

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn013	PROCESS TYPE	rotogravure process
FACILITY	Alford Industries, Inc.	PROCESS	rotogravure printing
ADDRESS	P.O. Box 300	LINE DESIGNATION	
	Ridgefield Park, NJ 07660	CONTROL DEVICE	NJStack007
TEST DATE	05/01/1991	TEST METHOD	EPA25
AGENCY	NJDEP	CONTROL TYPE	thermal incinerator
RATING	B	CONTROL MANUF	J. T. Thorpe
SCC	402900xx	DATE INSTALLED	n/r
		DESIGN FLOW (dscfm)	19000.00
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	n/r
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	natural gas
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
TGNMO	1	114	n/r	n/r	n/r	n/a	2152.00	65.00	28.478	n/r	n/r	100.00	n/r
TGNMO	2	108	704	n/r	n/r	n/a	2640.00	235.00	35.540	3.086	91.32	100.00	0.0
TGNMO	3	104	722	n/r	n/r	n/a	2309.00	186.00	32.103	2.502	92.21	100.00	0.0
AVERAGE											n/r	100.00	n/r

NOTES:

- 1 Average operating temperature is >1500. Outlet flow rate and temperature are illegible.
- 2 Average Operating Temperature is >1500.
- 3 Average operating temperature is >1500.

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn020	PROCESS TYPE	Airless, electrostatic coating of metal parts	
FACILITY	Ames Rubber Company	PROCESS	Metal Parts Coating	
ADDRESS	Ames Boulevard	LINE DESIGNATION		DESIGN RES TIME (s) 0.500
	Hamburg, NJ 07419	CONTROL DEVICE	NJ stack046	DESIGN OP TEMP (degF) 1500
	Wantage, NJ	TEST METHOD	NJ3.7	DESIGN EFFIC (%) n/r
TEST DATE	01/04/1990	CONTROL TYPE	thermal incinerator	DEMONSTRATED EFF (%) n/r
AGENCY	NJDEP	CONTROL MANUF	Smith Engineering	FUEL propane
RATING	A	DATE INSTALLED	n/r	SORBENT/CATALYST n/a
SCC	40200701	DESIGN FLOW (dscfm)	n/r	SORB/CAT AGE (yr) n/a

NOTES Heat recovery after incinerator. Inlet flow rate > outlet flow rate.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	44	524	n/r	n/r	n/a	3103.00	43.00	72.915	0.789	98.92	84.20	83.3
THC	2	59	532	n/r	n/r	n/a	2390.00	32.00	55.983	0.715	98.72	64.65	63.8
THC	3	74	530	n/r	n/r	n/a	2346.00	30.00	55.389	0.645	98.84	63.96	63.2
AVERAGE											98.83	70.94	70.1

NOTES: 1 Assumed "naphtholite" contribution to voc's negligible
 2 Assumed "naphtholite" contributions to VOC's negligible.
 3 Assumed "naphtholite" contribution to voc to be negligible.

n/a = data is not applicable.
 n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn020	PROCESS TYPE	Airless, electrostatic coating of metal parts	
FACILITY	Ames Rubber Company	PROCESS	Metal Parts Coating	
ADDRESS	Ames Boulevard	LINE DESIGNATION		DESIGN RES TIME (s) 0.500
	Hamburg, NJ 07419	CONTROL DEVICE	NJ stack046	DESIGN OP TEMP (degF) 1500
	Wantage, NJ	TEST METHOD	NJ3.9	DESIGN EFFIC (%) n/r
TEST DATE	01/04/1990	CONTROL TYPE	thermal incinerator	DEMONSTRATED EFF (%) n/r
AGENCY	NJDEP	CONTROL MANUF	Smith Engineering	FUEL propane
RATING	A	DATE INSTALLED	n/r	SORBENT/CATALYST n/a
SCC	40200701	DESIGN FLOW (dscfm)	n/r	SORB/CAT AGE (yr) n/a

NOTES Heat recovery after incinerator. Inlet flow rate > outlet flow rate.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
methyl ethyl ketone	1	44	524	n/r	n/r	n/a	363.20	2.00	8.535	0.037	99.57	24.41	24.3
methyl ethyl ketone	2	59	532	n/r	n/r	n/a	283.20	1.75	6.634	0.039	99.41	18.97	18.9
methyl ethyl ketone	3	74	530	n/r	n/r	n/a	214.00	2.45	5.053	0.053	98.95	14.45	14.3
AVERAGE											99.31	19.28	19.2
NOTES:		1	Outlet bag sample b.d.l., assumed 0										
		2	Outlet bag sample b.d.l., assumed 0.										
		3	Outlet bag sample b.d.l., assumed 0.										
methyl isobutyl keto	1	44	524	n/r	n/r	n/a	123.60	2.51	2.904	0.046	98.42	5.63	5.5
methyl isobutyl keto	2	59	532	n/r	n/r	n/a	699.00	2.67	16.373	0.060	99.63	31.72	31.6
methyl isobutyl keto	3	74	530	n/r	n/r	n/a	627.60	5.12	14.818	0.110	99.26	28.70	28.5
AVERAGE											99.10	22.02	21.9
NOTES:		1	Outlet bag sample b.d.l., assumed 0.										
		2	Outlet bag sample b.d.l., assumed 0.										
		3	Outlet bag sample b.d.l., assumed 0.										

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

B-40

PLANT CODE	dfn001	PROCESS TYPE	Vinyl flooring mfr. - thermal oxidizer
FACILITY	Congoleum Corporation	PROCESS	Vinyl flooring mfr.
ADDRESS	Sloan Avenue	LINE DESIGNATION	pilot line
		CONTROL DEVICE	thermal inc
	Trenton, NJ 08619	TEST METHOD	NJAT Method 3
TEST DATE	07/14/1989	CONTROL TYPE	thermal incinerator
AGENCY	NJDEP	CONTROL MANUF	Maxon
RATING	B	DATE INSTALLED	n/r
SCC	4029995	DESIGN FLOW (dscfm)	6000.00
		DESIGN RES TIME (s)	0.500
		DESIGN OP TEMP (degF)	1400
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	n/r
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES No certification of calibration gases. System operated outside of permit usage rate.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	236	1328	n/r	n/r	n/a	360.00	138.00	3.156	1.277	59.54	n/r	n/r
THC	2	235	1356	n/r	n/r	n/a	528.00	204.00	4.315	2.259	47.65	n/r	n/r
THC	3	240	1348	n/r	n/r	n/a	468.00	174.00	3.901	1.873	51.99	n/r	n/r
	AVERAGE										53.06	n/r	n/r

n/a = data is not applicable.
n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	pg7	PROCESS TYPE	3 Lembo v type rotogravure and one laminating	
FACILITY	Constant Services Inc.	PROCESS	Rotogravure Printing	
ADDRESS	17 Commerce Drive	LINE DESIGNATION	DESIGN RES TIME (s)	n/r
	Fairfield, NJ 07006	CONTROL DEVICE	DESIGN OP TEMP (degF)	n/r
TEST DATE	12/20/1988	TEST METHOD	DESIGN EFFIC (%)	n/r
AGENCY	NJDEP	CONTROL TYPE	DEMONSTRATED EFF (%)	n/r
RATING	C	CONTROL MANUF	FUEL	natural gas
SCC	40500511	DATE INSTALLED	SORBENT/CATALYST	n/a
		DESIGN FLOW (dscfm)	SORB/CAT AGE (yr)	n/a

NOTES Capture efficiency calculations are missing. Units on data sheets are missing. Summation of individual chemicals on sheets in appendix B are greater than reported on the page marked "Ink Solvent Content Breakdown". Xylol used in process but not tested. Quality rating B EPA18 data and C for 25A.

POLLUTANT	TEST	---TEMPERATURE---			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----			CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h	DRE %		
acetone	1	79	248	n/r	n/r	n/a	6.78	2.70	0.228	0.090	60.53	220.97	133.7
acetone	2	80	247	n/r	n/r	n/a	1.50	1.38	0.051	0.046	9.80	49.42	4.9
acetone	3	78	244	n/r	n/r	n/a	0.63	1.50	0.021	0.050	-138.10	20.93	-28.9
AVERAGE											-22.59	97.11	36.6
cyclohexanone	1	79	248	n/r	n/r	n/a	43.80	0.08	1.474	0.003	99.80	49.11	49.0
cyclohexanone	2	80	247	n/r	n/r	n/a	46.25	2.15	1.570	0.072	95.41	95.08	90.7
cyclohexanone	3	78	244	n/r	n/r	n/a	13.29	0.07	0.453	0.002	99.56	29.45	29.3
AVERAGE											98.26	57.88	56.4
methyl ethyl ketone	1	79	248	n/r	n/r	n/a	296.80	0.04	9.989	0.001	99.99	66.56	66.6
methyl ethyl ketone	2	80	247	n/r	n/r	n/a	246.70	6.88	8.373	0.231	97.24	59.01	57.4
methyl ethyl ketone	3	78	244	n/r	n/r	n/a	231.70	11.00	7.893	0.368	95.34	57.57	54.9
AVERAGE											97.52	61.05	59.6
methyl isobutyl keto	1	79	248	n/r	n/r	n/a	197.10	12.12	6.634	0.406	93.88	23.04	21.6
methyl isobutyl keto	2	80	247	n/r	n/r	n/a	192.30	11.34	6.526	0.380	94.18	24.48	23.1
methyl isobutyl keto	3	78	244	n/r	n/r	n/a	206.28	18.42	7.027	0.616	91.23	26.77	24.4
AVERAGE											93.10	24.76	23.0
toluene	1	79	248	n/r	n/r	n/a	17.61	0.09	0.593	0.003	99.49	20.39	20.3
toluene	2	80	247	n/r	n/r	n/a	24.43	3.17	0.829	0.106	87.21	31.71	27.7
toluene	3	78	244	n/r	n/r	n/a	9.25	4.68	0.315	0.157	50.16	12.52	6.3
AVERAGE											78.95	21.54	18.1

(continued)

PLANT CODE	pg7	PROCESS TYPE	3 Lembo v type rotogravure and one laminating		
FACILITY	Constant Services Inc.	PROCESS	Rotogravure Printing		
ADDRESS	17 Commerce Drive	LINE DESIGNATION		DESIGN RES TIME (s)	n/r
	Fairfield, NJ 07006	CONTROL DEVICE		DESIGN OP TEMP (degF)	n/r
TEST DATE	12/20/1988	TEST METHOD	NJ3.	DESIGN EFFIC (%)	n/r
AGENCY	NJDEP	CONTROL TYPE	thermal incinerator	DEMONSTRATED EFF (%)	n/r
RATING	C	CONTROL MANUF	Huntington Energy	FUEL	natural gas
SCC	40500511	DATE INSTALLED	n/r	SORBENT/CATALYST	n/a
		DESIGN FLOW (dscfm)	n/r	SORB/CAT AGE (yr)	n/a

NOTES Capture efficiency calculations are missing. Units on data sheets are missing. Summation of individual chemicals on sheets in appendix B are greater than reported on the page marked "Ink Solvent Content Breakdown". Xylol used in process but not tested. Quality rating B EPA18 data and C for 25A.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET	OUTLET	OPER			INLET	OUTLET	INLET	OUTLET			
		deg F	deg F	deg F	s	deg F	ppmv C	ppmv C	#C/h	#C/h			

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	cs003	PROCESS TYPE	retrogravure printing-incinerator
FACILITY	Crown Roll Leaf, Inc.	PROCESS	retrogravure printing
ADDRESS	9 Illinois Avenue	LINE DESIGNATION	DESIGN RES TIME (s) n/r
		CONTROL DEVICE	o fume inc
	Paterson, NJ 07501	TEST METHOD	NJ3
TEST DATE	01/20/1987	CONTROL TYPE	thermal incinerator
AGENCY	NJDEP	CONTROL MANUF	Machinery Services
RATING	C	DATE INSTALLED	n/r
SCC	40201301	DESIGN FLOW (dscfm)	n/r
			DESIGN OP TEMP (degF) n/r
			DESIGN EFFIC (%) n/r
			DEMONSTRATED EFF (%) n/r
			FUEL n/r
			SORBENT/CATALYST n/a
			SORB/CAT AGE (yr) n/a

NOTES

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
acetone	1	87	330	n/r	n/r	n/a	207.00	81.00	4.524	2.007	55.64	n/r	n/r
acetone	2	87	329	n/r	n/r	n/a	930.00	483.00	20.336	11.369	44.09	n/r	n/r
acetone	3	89	343	n/r	n/r	n/a	516.00	252.00	11.813	6.055	48.74	n/r	n/r
AVERAGE											49.49	n/r	n/r
ethanol	1	87	330	n/r	n/r	n/a	50.00	0.00	1.093	0.000	100.00	n/r	n/r
ethanol	2	87	329	n/r	n/r	n/a	558.00	46.00	12.202	1.083	91.12	n/r	n/r
ethanol	3	89	343	n/r	n/r	n/a	280.00	54.00	6.410	1.297	79.77	n/r	n/r
AVERAGE											90.30	n/r	n/r
NOTES:	1	Outlet concentration is N/D (0).											
methyl ethyl ketone		89	343	n/r	n/r	n/a	192.00	76.00	4.395	1.826	58.45	n/r	n/r
methyl ethyl ketone	1	87	330	n/r	n/r	n/a	64.00	10.00	1.399	0.248	82.27	n/r	n/r
methyl ethyl ketone	2	87	329	n/r	n/r	n/a	216.00	56.00	4.723	1.318	72.09	n/r	n/r
AVERAGE											70.94	n/r	n/r
methyl isobutyl keto	1	87	330	n/r	n/r	n/a	498.00	234.00	10.883	5.797	46.73	n/r	n/r
methyl isobutyl keto	2	87	329	n/r	n/r	n/a	84.00	30.00	1.837	0.706	61.57	n/r	n/r
methyl isobutyl keto	3	89	343	n/r	n/r	n/a	48.00	54.00	1.099	1.297	-18.02	n/r	n/r
AVERAGE											30.09	n/r	n/r
toluene	1	87	330	n/r	n/r	n/a	3528.00	203.00	77.101	5.029	93.48	n/r	n/r
toluene	2	87	329	n/r	n/r	n/a	4207.00	161.00	91.995	3.790	95.88	n/r	n/r
toluene	3	89	343	n/r	n/r	n/a	3283.00	203.00	75.158	4.877	93.51	n/r	n/r
AVERAGE											94.29	n/r	n/r

B-45

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn021	PROCESS TYPE	polyester film coating
FACILITY	Dri-Print Foils, Inc.	PROCESS	
ADDRESS	329 New Brunswick Avenue	LINE DESIGNATION	
	Rahway, NJ 07065	CONTROL DEVICE	AFB 2 Incin
TEST DATE	10/23/1991	TEST METHOD	
AGENCY	NJDEP	CONTROL TYPE	thermal incinerator
RATING	C	CONTROL MANUF	
SCC	40500512	DATE INSTALLED	n/r
		DESIGN FLOW (dscfm)	n/r

DESIGN RES TIME (s)	n/r
DESIGN OP TEMP (degF)	n/r
DESIGN EFFIC (%)	n/r
DEMONSTRATED EFF (%)	n/r
FUEL	n/r
SORBENT/CATALYST	n/a
SORB/CAT AGE (yr)	n/a

NOTES Many pages missing from this copy of the report.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	2	181	809	n/r	n/r	n/a	5450.00	54.00	109.089	1.136	98.96	100.00	0.0
THC	3	189	815	n/r	n/r	n/a	5470.00	72.00	110.508	1.569	98.58	100.00	0.0
THC	4	192	814	n/r	n/r	n/a	5460.00	78.00	109.798	1.656	98.49	100.00	0.0
	AVERAGE										98.68	100.00	0.0

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn006	PROCESS TYPE	rotogravure printing
FACILITY	Dri-Print Foils, Inc.	PROCESS	Polyester sheet coating
ADDRESS	329 New Brunswick Avenue	LINE DESIGNATION	
	Rahway, NJ 07065	CONTROL DEVICE	AFB-1
TEST DATE	10/24/1991	TEST METHOD	EPA25
AGENCY	NJDEP	CONTROL TYPE	thermal incinerator
RATING	C	CONTROL MANUF	
SCC	40500512	DATE INSTALLED	n/r
		DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	n/r
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	n/r
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES No documentation of system background test. 100% capture efficiency - Procedure T. This copy of the report is incomplete based on comparison w/TOC.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
TGNMO	1	162	752	n/r	n/r	n/a	4420.00	498.00	91.353	10.200	88.83	100.00	0.0
TGNMO	2	172	750	n/r	n/r	n/a	4050.00	126.00	82.952	2.534	96.95	100.00	0.0
TGNMO	3	172	748	n/r	n/r	n/a	5160.00	163.00	104.726	3.308	96.84	100.00	0.0
AVERAGE											94.21	100.00	0.0

NOTES: 2 Pause in sample collection of 30 minutes.

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	pg11	PROCESS TYPE	Auto Body Coating-Primer Curing Oven
FACILITY	GM Corp., Fisher Div.	PROCESS	Auto Body Coating
ADDRESS	1445 Parkway Ave.	LINE DESIGNATION	DESIGN RES TIME (s) 0.500
	Trenton, NJ 08650	CONTROL DEVICE	DESIGN OP TEMP (degF) 1400
TEST DATE	06/29/1988	TEST METHOD	DESIGN EFFIC (%) 99.00
AGENCY	NJDEP	CONTROL TYPE	DEMONSTRATED EFF (%) n/r
RATING	A	CONTROL MANUF	FUEL n/r
SCC	40200803	DATE INSTALLED	SORBENT/CATALYST n/a
		DESIGN FLOW (dscfm)	1480.00
			SORB/CAT AGE (yr) n/a
NOTES	Design RT 0.5-1.0 s.		

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	341	1110	n/r	n/r	n/a	312.00	96.00	1.266	0.382	69.83	n/r	n/r
THC	2	341	1117	n/r	n/r	n/a	247.00	48.00	1.008	0.195	80.65	n/r	n/r
THC	3	355	1138	n/r	n/r	n/a	244.00	78.00	0.980	0.328	66.53	n/r	n/r
AVERAGE											72.34	n/r	n/r

n/a = data is not applicable.
n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	cs001	PROCESS TYPE	Polyester Film Coating
FACILITY	Gomar Manufacturing	PROCESS	
ADDRESS	1501 West Blancke Street	LINE DESIGNATION	
	Linden, NJ 07036	CONTROL DEVICE	Boart
TEST DATE	12/17/1991	TEST METHOD	EPA25
AGENCY	NJDEPE	CONTROL TYPE	thermal incinerator
RATING	A	CONTROL MANUF	Boart Metal Products
SCC	402900xx	DATE INSTALLED	01/01/1984
		DESIGN FLOW (dscfm)	5000.00
		DESIGN RES TIME (s)	0.500
		DESIGN OP TEMP (degF)	1500
		DESIGN EFFIC (%)	99.00
		DEMONSTRATED EFF (%)	99.00
		FUEL	natural gas
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES Low audit +62.6%, High Audit-48.4%, data quality rating "A" by OAQPS contractor should be reduced.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
TGNMO	2	201	1130	n/r	n/r	n/a	11253.00	59.00	69.794	0.367	99.47	100.00	99.7
TGNMO	3	204	1160	n/r	n/r	n/a	17575.00	150.00	110.936	0.909	99.18	100.00	99.2
TGNMO	4	205	1218	n/r	n/r	n/a	17350.00	63.00	110.162	0.370	99.66	100.00	99.7
AVERAGE											99.44	100.00	99.5

NOTES:

- 2 Usage rate based on measured production rate and solids/unit production. Solvent pollutant content is in #C/#VOC.
- 3 Usage rate based on measured production rate and solids/unit production. Solvent pollutant content in #C/#VOC.
- 4 Usage rate based on measured production rate and solids/unit production. Solvent pollutant content in #C/VOC.

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	pg8	PROCESS TYPE	Laminating Printer, Ross Waldron Thermal Oxidation Unit
FACILITY	J. Josephson Inc.	PROCESS	Laminating Printer
ADDRESS	20 Horizon Blvd	LINE DESIGNATION	Press #2 and #3
		CONTROL DEVICE	DESIGN RES TIME (s) n/r
	S. Hackensack, NJ 07606	TEST METHOD	DESIGN OP TEMP (degF) n/r
TEST DATE	12/16/1988	CONTROL TYPE	DESIGN EFFIC (%) n/r
AGENCY	NJDEP	CONTROL MANUF	DEMONSTRATED EFF (%) n/r
RATING	A	DATE INSTALLED	FUEL n/r
SCC	402900xx	DESIGN FLOW (dscfm)	SORBENT/CATALYST n/a
			SORB/CAT AGE (yr) n/a

NOTES Ink formulations are not included.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	80	253	n/r	n/r	n/a	2485.20	100.80	87.021	3.700	95.75	n/r	n/r
THC	2	85	249	n/r	n/r	n/a	2493.00	103.80	89.118	3.797	95.74	n/r	n/r
THC	3	82	243	n/r	n/r	n/a	2506.20	93.00	89.200	3.473	96.11	n/r	n/r
	AVERAGE										95.87	n/r	n/r

NOTES: 1 Ink Formulations were not included.

n/a = data is not applicable.
n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	pg1	PROCESS TYPE	paper coating-thermal incinerator
FACILITY	Keuffel & Esser Redon Facility	PROCESS	paper coating
ADDRESS	Ford Road	LINE DESIGNATION	A-2, T
		CONTROL DEVICE	thermal inc
TEST DATE	Rockaway, NJ 07866	TEST METHOD	EPA25
	04/19/1988	CONTROL TYPE	thermal incinerator
AGENCY	NJ	CONTROL MANUF	Smith Engineering
RATING	A	DATE INSTALLED	n/r
SCC	402013xx	DESIGN FLOW (dscfm)	n/r

DESIGN RES TIME (s)	n/r
DESIGN OP TEMP (degF)	n/r
DESIGN EFFIC (%)	n/r
DEMONSTRATED EFF (%)	n/r
FUEL	n/r
SORBENT/CATALYST	n/a
SORB/CAT AGE (yr)	n/a

NOTES NIOSH methods: Toluene-1501, Ethyl Acetate-2(549), Acetic Acid 1603, Ethyl Alcohol-2(556). All below DL. 1st tests stopped because production line stopped.

Plant state is New Jersey DEP DEQ.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
TGNMO	2	130	731	n/r	n/r	n/a	5019.98	79.20	50.792	0.905	98.22	40.01	39.3
TGNMO	3	131	736	n/r	n/r	n/a	7516.04	109.50	79.345	1.161	98.54	68.57	67.6
TGNMO	4	129	736	n/r	n/r	n/a	6823.97	127.80	64.470	1.246	98.07	55.36	54.3
AVERAGE											98.28	54.65	53.7

NOTES: 2 Lines A-2 and T connect and go to incinerator. T is enclosed but A is not. Temperatures are weighed by SCFM flow and
 Solvent pollutant content is in #C/#.
 3 Solvent pollutant content is in #C/#.

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

B-52

PLANT CODE	dfn003	PROCESS TYPE	Web offset lithography-heat set
FACILITY	L.P. Thebault Company	PROCESS	Web offset lithography
ADDRESS		LINE DESIGNATION	Web 15 + Web 16
		CONTROL DEVICE	
	Parsippany, NJ	TEST METHOD	NJAT Method 3-7
TEST DATE	06/08/1990	CONTROL TYPE	thermal incinerator
AGENCY	NJDEP	CONTROL MANUF	TEC Systems
RATING	B	DATE INSTALLED	n/r
SCC	40500411	DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	n/r
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	n/r
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES No documentation of testing, hand-written calculations only. Capture efficiency 73%. Paper printing. Report prepared for TEC Systems; results may be "demonstrated efficiency". Isopropanol emission rates are reported based upon calculations.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	250	456	1412	n/r	n/a	572.00	6.80	2.432	0.036	98.52	n/r	n/r
THC	2	271	458	1414	n/r	n/a	626.00	5.20	2.658	0.025	99.06	n/r	n/r
THC	3	268	456	1413	n/r	n/a	664.00	6.00	2.720	0.030	98.90	n/r	n/r
AVERAGE											98.83	n/r	n/r

n/a = data is not applicable.
n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn019	PROCESS TYPE	adhesive film coating		
FACILITY	Lamart Corp.	PROCESS	3 laminating/coating lines		
ADDRESS	16 Richmond St. 37 Chestnut St. Clifton, NJ 07015	LINE DESIGNATION		DESIGN RES TIME (s)	0.500
TEST DATE	11/30/1990	CONTROL DEVICE	NJstack010	DESIGN OP TEMP (degF)	1500
AGENCY	NJDEP	TEST METHOD	NJAT 3.7	DESIGN EFFIC (%)	n/r
RATING	C	CONTROL TYPE	thermal incinerator	DEMONSTRATED EFF (%)	n/r
SCC	40200701	CONTROL MANUF	Huntingdon En. Syst.	FUEL	n/r
		DATE INSTALLED	n/r	SORBENT/CATALYST	n/a
		DESIGN FLOW (dscfm)	n/r	SORB/CAT AGE (yr)	n/a

NOTES No strip charts-manual readings only. No calibration gas certification. Minimal documentation of sample analyses. 100% capture efficiency. Ethyl Acetate, Isopropyl Alcohol, none detected. Methyl Ethyl Ketone destruction efficiency 96.8%. Toluene destruction efficiency 95.0%.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	131	296	1510	n/r	n/a	3813.00	112.00	112.446	4.030	96.42	100.00	0.0
THC	2	124	283	1508	n/r	n/a	3664.00	109.00	112.439	4.117	96.34	100.00	0.0
THC	3	126	294	1510	n/r	n/a	3722.00	79.00	108.591	2.640	97.57	100.00	0.0
AVERAGE											96.78	100.00	0.0

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn019	PROCESS TYPE	adhesive film coating
FACILITY	Lamart Corp.	PROCESS	3 laminating/coating lines
ADDRESS	16 Richmond St. 37 Chestnut St. Clifton, NJ 07015	LINE DESIGNATION	
TEST DATE	11/30/1990	CONTROL DEVICE	NJstack010
AGENCY	NJDEP	TEST METHOD	NJAT 3.9
RATING	C	CONTROL TYPE	thermal incinerator
SCC	40200701	CONTROL MANUF	Huntingdon En. Syst.
		DATE INSTALLED	n/r
		DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	0.500
		DESIGN OP TEMP (degF)	1500
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	n/r
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES No strip charts-manual readings only. No calibration gas certification. Minimal documentation of sample analyses. 100% capture efficiency. Ethyl Acetate, Isopropyl Alcohol, none detected. Methyl Ethyl Ketone destruction efficiency 96.8%. Toluene destruction efficiency 95.0%.

POLLUTANT	TEST	---TEMPERATURE---			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
ethyl acetate	1	126	296	1510	n/r	n/a	140.80	0.00	4.152	0.000	100.00	100.00	0.0
ethyl acetate	2	124	283	1508	n/r	n/a	130.40	0.00	4.002	0.000	100.00	100.00	0.0
ethyl acetate	3	126	294	1510	n/r	n/a	0.00	0.00	n/r	0.000	n/r	100.00	0.0
AVERAGE											n/r	100.00	0.0
NOTES:	1	Outlet VOC concentration is <4.0. Outlet emission rate is <0.14. DRE is >96.6.											
	2	Outlet VOC concentration is <4.0. Outlet emission rate is <0.15. DRE is >96.2.											
	3	Inlet and outlet VOC concentrations are <4.0. Inlet and outlet emission rates are <0.11 and <0.14, respectively.											
isopropanol	1	126	296	1510	n/r	n/a	0.00	0.00	n/r	0.000	n/r	100.00	0.0
isopropanol	2	124	283	1508	n/r	n/a	0.00	0.00	n/r	0.000	n/r	100.00	0.0
isopropanol	3	126	294	1510	n/r	n/a	33.30	0.00	0.972	0.000	100.00	100.00	0.0
AVERAGE											n/r	100.00	0.0
NOTES:	1	Inlet and outlet VOC concentrations are <6.0. Inlet and outlet emission rates are <0.18 and 0.22, respectively.											
	2	Inlet and outlet VOC concentrations are <6.0. Inlet and outlet emission rates are <0.19 and 0.23, respectively.											
	3	Outlet VOC concentration is <6.0. Outlet emission rate is <0.20. DRE is >79.4.											
methyl ethyl ketone	1	126	296	1510	n/r	n/a	2968.00	107.60	87.527	3.872	95.58	100.00	0.0
methyl ethyl ketone	2	124	283	1508	n/r	n/a	2928.00	103.60	89.853	3.913	95.65	100.00	0.0
methyl ethyl ketone	3	126	294	1510	n/r	n/a	3524.00	38.00	102.814	1.270	98.76	100.00	0.0
AVERAGE											96.66	100.00	0.0

B-55

(continued)

PLANT CODE	dfn019	PROCESS TYPE	adhesive film coating
FACILITY	Lamart Corp.	PROCESS	3 laminating/coating lines
ADDRESS	16 Richmond St. 37 Chestnut St. Clifton, NJ 07015	LINE DESIGNATION	
TEST DATE	11/30/1990	CONTROL DEVICE	NJstack010
AGENCY	NJDEP	TEST METHOD	NJAT 3.9
RATING	C	CONTROL TYPE	thermal incinerator
SCC	40200701	CONTROL MANUF	Huntingdon En. Syst.
		DATE INSTALLED	n/r
		DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	0.500
		DESIGN OP TEMP (degF)	1500
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	n/r
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES No strip charts-manual readings only. No calibration gas certification. Minimal documentation of sample analyses. 100% capture efficiency. Ethyl Acetate, Isopropyl Alcohol, none detected. Methyl Ethyl Ketone destruction efficiency 96.8%. Toluene destruction efficiency 95.0%.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
toluene	1	126	296	1510	n/r	n/a	420.00	17.50	12.386	0.630	94.91	100.00	0.0
toluene	2	124	283	1508	n/r	n/a	415.10	17.50	12.738	0.661	94.81	100.00	0.0
toluene	3	126	294	1510	n/r	n/a	131.60	7.00	3.839	0.234	93.90	100.00	0.0
AVERAGE											94.54	100.00	0.0

n/a = data is not applicable.
n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn004	PROCESS TYPE	
FACILITY	Mannington Mills, Inc.	PROCESS	laminating printers
ADDRESS	P.O. Box 30	LINE DESIGNATION	NJ Stack No. 043 Print II
		CONTROL DEVICE	Print II
	Salem, NJ 08079	TEST METHOD	NJAT Method 3
TEST DATE	06/04/1987	CONTROL TYPE	thermal incinerator
AGENCY	NJDEP	CONTROL MANUF	Huntingdon Ener. Sys
RATING	B	DATE INSTALLED	n/r
SCC	308007xx	DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	n/r
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	natural gas
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES No certification of calibration gases, appears only one was used.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	140	320	1580	n/r	n/a	1143.00	48.30	49.035	2.446	95.01	n/r	n/r
THC	2	140	338	1560	n/r	n/a	1341.00	52.30	55.691	2.535	95.45	n/r	n/r
THC	3	140	326	1560	n/r	n/a	1372.00	46.50	58.151	2.389	95.89	n/r	n/r
	AVERAGE										95.45	n/r	n/r

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn005	PROCESS TYPE	
FACILITY	Mannington Mills, Inc.	PROCESS	laminating printers
ADDRESS	P.O. Box 30	LINE DESIGNATION	NJ Stack No. 42. Print III
		CONTROL DEVICE	Print III
	Salem, NJ 08079	TEST METHOD	NJAT Method 3
TEST DATE	06/05/1987	CONTROL TYPE	thermal incinerator
AGENCY	NJDEP	CONTROL MANUF	Ross Waldron
RATING	B	DATE INSTALLED	n/r
SCC	308007xx	DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	n/r
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	natural gas
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES No certification of calibration gases, appears only one was used.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	131	301	1525	n/r	n/a	824.00	16.40	41.080	1.013	97.53	n/r	n/r
THC	2	117	266	1550	n/r	n/a	592.00	11.60	31.562	0.712	97.74	n/r	n/r
THC	3	125	281	1550	n/r	n/a	687.00	15.80	36.929	0.955	97.41	n/r	n/r
AVERAGE											97.56	n/r	n/r

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn014	PROCESS TYPE	processes metal can coatings
FACILITY	Milton Can Company	PROCESS	sheet metal coating
ADDRESS		LINE DESIGNATION	
	Elizabeth, NJ	CONTROL DEVICE	NJStack005
TEST DATE	05/24/1991	TEST METHOD	NJAT Method 3
AGENCY	NJDEP	CONTROL TYPE	thermal incinerator
RATING	B	CONTROL MANUF	CorPak
SCC	402017xx	DATE INSTALLED	n/r
		DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	1400
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	natural gas
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES Methyl ethyl ketone 8.01: lb/hr, 136 lb/ton, "A", 99.87 destruction efficiency; N-butanol: 0.95 lb/hr, 16.2 lb/ton, "A", 98.91 destruction efficiency; Ethyl Benzene: 3.11 lb/hr, 52.9 lb/ton, "A", 99.52 destruction efficiency; Xylene: 11.76 lb/hr, 200 lb/ton, "A", 99.87 destruction efficiency; EEP: 12.90 lb/hr, 219 lb/ton, "A", 99.84 destruction efficiency.

POLLUTANT	TEST	---TEMPERATURE---			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
2-ethoxyethyl acetat	1H	n/r	n/r	1425	n/r	n/a	266.40	1.80	3.820	0.010	99.74	n/r	n/r
2-ethoxyethyl acetat	1L	n/r	n/r	1425	n/r	n/a	316.20	1.80	4.269	0.012	99.72	n/r	n/r
2-ethoxyethyl acetat	2H	n/r	n/r	1425	n/r	n/a	406.80	1.80	6.298	0.010	99.84	n/r	n/r
2-ethoxyethyl acetat	2L	n/r	n/r	1425	n/r	n/a	238.80	1.80	3.026	0.011	99.64	n/r	n/r
2-ethoxyethyl acetat	3H	n/r	n/r	1425	n/r	n/a	310.80	1.80	4.651	0.010	99.78	n/r	n/r
AVERAGE											99.74	n/r	n/r
2-ethyl-3-ethoxy pro	1H	n/r	n/r	1425	n/r	n/a	424.90	2.10	6.093	0.011	99.82	n/r	n/r
2-ethyl-3-ethoxy pro	1L	n/r	n/r	1425	n/r	n/a	337.40	2.10	4.555	0.014	99.69	n/r	n/r
2-ethyl-3-ethoxy pro	2H	n/r	n/r	1425	n/r	n/a	669.20	2.10	10.361	0.012	99.88	n/r	n/r
2-ethyl-3-ethoxy pro	2L	n/r	n/r	1425	n/r	n/a	351.40	2.10	4.453	0.012	99.73	n/r	n/r
2-ethyl-3-ethoxy pro	3H	n/r	n/r	1425	n/r	n/a	382.90	2.10	5.730	0.012	99.79	n/r	n/r
AVERAGE											99.78	n/r	n/r
THC	1H	n/r	n/r	1425	n/r	n/a	1631.00	1.00	23.390	0.005	99.98	n/r	n/r
THC	1L	n/r	n/r	1425	n/r	n/a	1294.00	1.00	17.471	0.007	99.96	n/r	n/r
THC	2H	n/r	n/r	1425	n/r	n/a	2452.00	2.00	37.963	0.011	99.97	n/r	n/r
THC	2L	n/r	n/r	1425	n/r	n/a	1229.00	1.00	15.575	0.006	99.96	n/r	n/r
THC	3H	n/r	n/r	1425	n/r	n/a	2148.00	7.00	32.144	0.040	99.88	n/r	n/r
AVERAGE											99.95	n/r	n/r
ethyl benzene	1H	n/r	n/r	1425	n/r	n/a	136.00	2.40	1.950	0.013	99.33	n/r	n/r
ethyl benzene	1L	n/r	n/r	1425	n/r	n/a	126.40	2.40	1.707	0.016	99.06	n/r	n/r
ethyl benzene	2H	n/r	n/r	1425	n/r	n/a	208.80	2.40	3.233	0.013	99.60	n/r	n/r
ethyl benzene	2L	n/r	n/r	1425	n/r	n/a	119.20	2.40	1.511	0.014	99.07	n/r	n/r

B-60

ethyl benzene	3H	n/r	n/r	1425	n/r	n/a	218.40	2.40	3.268	0.014	99.57	n/r	n/r
---------------	----	-----	-----	------	-----	-----	--------	------	-------	-------	-------	-----	-----

(continued)

PLANT CODE	dfn014	PROCESS TYPE	processes metal can coatings
FACILITY	Milton Can Company	PROCESS	sheet metal coating
ADDRESS		LINE DESIGNATION	
	Elizabeth, NJ	CONTROL DEVICE	NJStack005
TEST DATE	05/24/1991	TEST METHOD	NJAT Method 3
AGENCY	NJDEP	CONTROL TYPE	thermal incinerator
RATING	B	CONTROL MANUF	CorPak
SCC	402017xx	DATE INSTALLED	n/r
		DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	1400
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	natural gas
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES Methyl ethyl ketone 8.01: lb/hr, 136 lb/ton, "A", 99.87 destruction efficiency; N-butanol: 0.95 lb/hr, 16.2 lb/ton, "A", 98.91 destruction efficiency; Ethyl Benzene: 3.11 lb/hr, 52.9 lb/ton, "A", 99.52 destruction efficiency; Xylene: 11.76 lb/hr, 200 lb/ton, "A", 99.87 destruction efficiency; EEP: 12.90 lb/hr, 219 lb/ton, "A", 99.84 destruction efficiency.

POLLUTANT	TEST	---TEMPERATURE---			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
AVERAGE											99.33	n/r	n/r
methyl ethyl ketone	1H	n/r	n/r	1425	n/r	n/a	224.00	1.20	3.212	0.007	99.78	n/r	n/r
methyl ethyl ketone	1L	n/r	n/r	1425	n/r	n/a	200.00	1.20	2.700	0.008	99.70	n/r	n/r
methyl ethyl ketone	2H	n/r	n/r	1425	n/r	n/a	327.20	1.20	5.066	0.007	99.86	n/r	n/r
methyl ethyl ketone	2L	n/r	n/r	1425	n/r	n/a	170.40	1.20	2.159	0.007	99.68	n/r	n/r
methyl ethyl ketone	3H	n/r	n/r	1425	n/r	n/a	516.40	1.20	7.728	0.007	99.91	n/r	n/r
AVERAGE											99.79	n/r	n/r
n-butanol	1H	n/r	n/r	1425	n/r	n/a	28.00	1.20	0.402	0.007	98.26	n/r	n/r
n-butanol	1L	n/r	n/r	1425	n/r	n/a	25.20	1.20	0.340	0.008	97.65	n/r	n/r
n-butanol	2H	n/r	n/r	1425	n/r	n/a	46.00	1.20	0.712	0.007	99.02	n/r	n/r
n-butanol	2L	n/r	n/r	1425	n/r	n/a	23.20	1.20	0.294	0.007	97.62	n/r	n/r
n-butanol	3H	n/r	n/r	1425	n/r	n/a	49.60	1.20	0.742	0.007	99.06	n/r	n/r
AVERAGE											98.32	n/r	n/r
xylenes	1H	n/r	n/r	1425	n/r	n/a	540.00	2.40	7.744	0.013	99.83	n/r	n/r
xylenes	1L	n/r	n/r	1425	n/r	n/a	606.40	2.40	8.187	0.016	99.80	n/r	n/r
xylenes	2H	n/r	n/r	1425	n/r	n/a	846.40	2.40	13.104	0.013	99.90	n/r	n/r
xylenes	2L	n/r	n/r	1425	n/r	n/a	479.20	2.40	6.073	0.014	99.77	n/r	n/r
xylenes	3H	n/r	n/r	1425	n/r	n/a	729.60	2.40	10.918	0.014	99.87	n/r	n/r
AVERAGE											99.83	n/r	n/r

B-62

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn007	PROCESS TYPE	Rotogravure Printing
FACILITY	Newco, Inc.	PROCESS	Rotogravure Printing
ADDRESS	Hicks Avenue	LINE DESIGNATION	
	Newton, NJ 07880	CONTROL DEVICE	thermal in.
TEST DATE	08/18/1989	TEST METHOD	NJAT Method 3.7
AGENCY	NJDEP	CONTROL TYPE	thermal incinerator
RATING	B	CONTROL MANUF	Huntingdon En. Sys.
SCC	40500511	DATE INSTALLED	n/r
		DESIGN FLOW (dscfm)	n/r
		DESIGN RES TIME (s)	n/r
		DESIGN OP TEMP (degF)	n/r
		DESIGN EFFIC (%)	n/r
		DEMONSTRATED EFF (%)	n/r
		FUEL	natural gas
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES NJ Method 3.9: impingers and tedlar bag. Capture efficiency 84.6% according to test, 58.2% according to NJDEP; NJDEP ink usage rates used to calculate EF. Acetone, methyl ethyl ketone, methyl isobutyl ketone not detected at outlet.

POLLUTANT	TEST	---TEMPERATURE---			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	81	219	n/r	n/r	n/a	2241.00	290.00	47.060	6.899	85.34	n/r	n/r
THC	2	83	220	n/r	n/r	n/a	2640.00	114.00	55.709	2.749	95.07	n/r	n/r
THC	3	85	221	n/r	n/r	n/a	2328.00	105.00	49.173	2.504	94.91	n/r	n/r
AVERAGE											91.77	n/r	n/r

NOTES: 1 Capture efficiency based upon sum of acetone, methyl ethyl ketone, and methyl isobutyl ketone results versus sorbent usage. Capture could be improved by inclusion of the toluene data. Sum (actone, methyl ethyl ketone, methyl isobutyl ketone) inlet emission rate larger than THC inlet emission rate.

n/a = data is not applicable.

n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn002	PROCESS TYPE	Metal (Coil) Coating-Thermal Incinerator
FACILITY	Prior Coated Metals, Inc.	PROCESS	Metal (Coil) Coating
ADDRESS	2233 26th Street S.W.	LINE DESIGNATION	Metal Coil Coater
		CONTROL DEVICE	Thermal inc
TEST DATE	Allentown, PA 18103	TEST METHOD	EPA25
AGENCY	09/20/1989	CONTROL TYPE	thermal incinerator
RATING	PA DER	CONTROL MANUF	Hirt Combustion Eng.
SCC	A	DATE INSTALLED	01/01/1982
	40201801	DESIGN FLOW (dscfm)	4840.00
		DESIGN RES TIME (s)	0.800
		DESIGN OP TEMP (degF)	1500
		DESIGN EFFIC (%)	99.00
		DEMONSTRATED EFF (%)	99.00
		FUEL	natural gas
		SORBENT/CATALYST	n/a
		SORB/CAT AGE (yr)	n/a

NOTES Capture efficiency 73.6%. 2 run is in 1st part only. NO raw data, all typed PaDir. No documentation of performance test duration. No documentation of system background test. Inlet tests were performed after the drying ovens; do not account for any destruction/control due to the ovens.

POLLUTANT	TEST	---TEMPERATURE---			RESIDENCE TIME	CATALYST DELTA T	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
TGNMO	1	556	1303	1420	0.631	n/a	13382.00	1501.00	161.961	17.887	88.96	194.32	172.9
TGNMO	2	556	1303	1416	0.632	n/a	20214.00	190.00	244.648	2.264	99.07	267.87	265.4
AVERAGE											94.02	231.10	219.1

NOTES: 1 Units for solvent pollutant content are #C/#.
 2 Units for solvent pollutant content are #C/#.

n/a = data is not applicable.
 n/r = data is not reported or data required for calculation is not reported.

PLANT CODE	dfn018	PROCESS TYPE	heat setting ovens vented to fume incinerators	
FACILITY	Rebtext, Inc.	PROCESS	textile coating	
ADDRESS		LINE DESIGNATION	Number 3 dryer exhaust	DESIGN RES TIME (s) n/r
		CONTROL DEVICE	NJ Stack010	DESIGN OP TEMP (degF) 1500
TEST DATE	Somerville, NJ	TEST METHOD	NJAT Method 3-7	DESIGN EFFIC (%) n/r
	06/18/1991	CONTROL TYPE	thermal incinerator	DEMONSTRATED EFF (%) n/r
AGENCY	NJDEP	CONTROL MANUF	Process Combustion	FUEL natural gas
RATING	C	DATE INSTALLED	n/r	SORBENT/CATALYST n/a
SCC	40201101	DESIGN FLOW (dscfm)	10000.00	SORB/CAT AGE (yr) n/a

NOTES No certification of calibration gases. Analyzer calibrated with propane, but results reported as methane. Incomplete copy of report, inlet not tested.

POLLUTANT	TEST	----TEMPERATURE----			RESIDENCE TIME s	CATALYST DELTA T deg F	VOC CONCENTRATION		-----EMISSIONS-----		DRE %	CAPTURE EFFIC %	OVERALL CONTROL EFFECT %
		INLET deg F	OUTLET deg F	OPER deg F			INLET ppmv C	OUTLET ppmv C	INLET #C/h	OUTLET #C/h			
THC	1	n/r	868	1510	n/r	n/a	0.00	9.60	n/r	0.115	n/r	n/r	n/r
THC	2	n/r	864	1506	n/r	n/a	0.00	1.90	n/r	0.025	n/r	n/r	n/r
THC	3	n/r	866	1511	n/r	n/a	0.00	0.70	n/r	0.009	n/r	n/r	n/r
AVERAGE											n/r	n/r	n/r

NOTES: 1 Inlet not tested.
 2 Inlet not tested.
 3 Inlet not tested.

n/a = data is not applicable.
 n/r = data is not reported or data required for calculation is not reported.

APPENDIX C
REPORT REVIEWS

Congoleum Corporation, Trenton, NJ, 7/14-17/89 - Produces vinyl flooring. Exhaust from the pilot line is controlled by a Maxon afterburner. EPA Methods 2, 3, 4, and 10 were performed along with NJAT Method 3. NJDEP noted that the production rate was above the permit usage rate which may explain the low destruction efficiency. Assigned a rating of "B" in the OAQPS dBASE file. (dfn001)

Prior Coated Metals, Incorporated, Allentown, PA, 9/20/89 - Paints metal coils. After painting, the coils are dried in a direct-fired oven. The oven exhaust is ducted to a Hurt Combustion Engineering thermal incinerator. EPA Method 25 was used to determine THC from the inlet and outlet of the incinerator. Destruction efficiency and capture efficiency values may be lower than reality because the inlet tests do not account for destruction occurring in the ovens. The report was not rated in OAQPS dBASE file. Assigned an "A". (dfn002)

L.P. Thebault Company, Parsippany, NJ, 6/8/90 - This report should probably be eliminated from this file because it appears to be in the category of paper printing ("solvent retention in the printed paper product"). Performs heatset web offset lithography. The control device is a TEC Systems thermal incinerator. EPA Methods 1, 2, 3, and NJAT Method 3-7 were performed. Isopropanol results are also reported but are based on calculations rather than sampling and analysis. The report was not rated in OAQPS dBASE file. Assigned a "B" because of the lack of detail in the report. These results may represent "demonstrated efficiency" since the report was prepared for TEC Systems. (dfn003)

Mannington Mills, Incorporated, Salem, NJ, 6/4/87 - Prints and laminates paper. Uses both tray and roller type laminating printers. Fume hoods from several machines are manifolded at the inlet of a Huntington Energy Systems thermal incinerator. The Huntington Energy Systems thermal oxidizer is a regenerative heat recovery system utilizing at least three ceramic beds. The first unit preheats the inlet stream. Combustion occurs in the second unit. The third unit extracts heat from the exhaust stream. As the first bed cools, the functions of the identical units are switched so that recovered heat is available for

the preheating function. This installation utilizes five ceramic beds. These results may be "demonstrated efficiency" since the introduction describes it as a new installation. EPA Methods 1, 2, 3, and NJAT Method 3-7 were performed. Assigned a rating of "B" in the OAQPS dBASE file. (dfn004, dfn005)

Dri-Print Foils Incorporated, Rahway, NJ, 10/24/91 - Produces polyester film coating. A thermal incinerator is used. This report covers the testing of AFB-1 incinerator. This report does not appear to have been in the OAQPS dBASE file. Assigned a "C" because of the lack of detail in the report probably due to missing pages in this copy of the report. (dfn006)

Newco, Incorporated, Newton, NJ, 8/18/89 - This plant performs rotogravure printing. Negative draft capture hooding on three rotogravure presses and one laminating printer and manifolded at the inlet of a Huntington Energy Systems thermal incinerator. The Huntington Energy Systems thermal oxidizer is a regenerative heat recovery system utilizing at least three ceramic beds. The first unit preheats the inlet stream. Combustion occurs in the second unit. The third unit extracts heat from the exhaust stream. As the first bed cools, the functions of the identical units are switched so that recovered heat is available for the preheating function. EPA Methods 1, 2, 3, and 4 were performed along with NJAT Methods 3-7 and 3-9. Specific testing was performed for acetone, methylethyl ketone, and methylisobutyl ketone. Capture efficiency was calculated from the sum of the specific analytes versus the gross solvent usage. Examination of the raw data indicates that toluene was present but not reported. Inclusion of toluene data would have improved this capture efficiency. Assigned a rating of "B" in the OAQPS dBASE file. (dfn007)

Roysons, Incorporated, Rockaway, NJ, 12/11/90 - Produces vinyl wall covering. Negative draft capture hooding on three U-type Lembo presses and one stack type color printer and manifolded at the inlet of an EDA catalytic incinerator. EPA Methods 1, 2, 3, and 10 were performed along with NJAT Methods 3-7 and 3-9. Specific testing was performed for acetone, methylethyl ketone,

methylisobutyl ketone, and toluene. Capture efficiency was calculated from the sum of the specific analytes versus the gross solvent usage. Assigned a rating of "C" in the OAQPS dBASE file. (dfn008)

Pittsburgh Metal Lithographing Company, Incorporated, Sewickley, PA, 8/24/88 - Testing was performed on a metal coating line controlled by a catalytic incinerator. EPA Method 25 was used to determine TGNMOC from the inlet and outlet of the incinerator. The report was not rated in OAQPS dBASE file. Assigned a "C" because of lack of detail in the report, and questionable results for one run which was not repeated. Capture efficiency greater than 100 percent was reported for two of the three runs. (dfn009)

Evans Cooperage of Houston, Incorporated, Houston, TX, 6/18/88 - Paint barrels. The spray booth is vented to a thermal incinerator. EPA Methods 1, 2, 3, 4, 5, and 25A were performed. The inlet was not tested. Assigned a rating of "C" in the OAQPS dBASE file. (dfn010)

Transco Products Corporation, Linden, NJ, 6/17/91 - Coats metal discs for the recording industry with a protective nitrocellulose lacquer. Seventy drying boxes plus the curtain coating area are manifolded and vented to a platinum impregnated catalytic oxidizer. The catalyst inlet is temperature controlled. CEMs monitor inlet and outlet temperature, and outlet oxygen and carbon monoxide. Methods are not specified. Testing was performed for THC, ethanol, methylethyl ketone, ethyl acetate, butyl acetate, and toluene. The report was not rated in OAQPS dBASE file. Assigned a "C" because of lack of detail in the report. (dfn011)

Ciba-Geigy Corporation, Summit, NJ, 5/7/91 - Produces adhesive patch pharmaceutical products. Chloroform emissions from the laminating coater are controlled by a VIC Manufacturing Corporation dual-bed carbon adsorber. An unspecified CEM monitors the exhaust for breakthrough. NJAT method 3.9 was used to analyze inlet and outlet for chloroform. Assigned a rating of "A" in the OAQPS dBASE file. (dfn012)

Alford Industries, Incorporated, Ridgefield Park, NJ, 5/1/91 - Rotogravure printing on a paperboard web is performed here. The product is transferred to a hot air dryer after coating. The exhaust of the dryer is vented to a J.T. Thorpe thermal oxidizer which was fired by natural gas and operated above 1,500 °F throughout these tests. EPA Methods 1, 2, 3, 4, and 25 were performed. EPA Procedure T was shown to apply. Therefore, 100 percent capture is assumed in the calculations. The report was not rated in OAQPS dBASE file. Assigned a rating of "B". (dfn013)

Milton Can Company, Elizabeth, NJ, 5/24/91 - Produces metal containers. Prior to forming operations, sheet metal is coated with a solvent borne polymeric material to protect against corrosion. The drying oven exhaust is ducted to a Cor Pak direct flame incinerator. A fume hood over the roller applicator is ducted directly to atmosphere. The system was tested under two production levels. EPA Methods 1, 2, 3, 3A, 4, and 10 were performed along with NJAT Methods 3-7 and 3-9. Specific analyses were performed for methylethyl ketone, n-butanol, ethyl benzene, xylenes, 2-ethoxyethyl acetate, and 2-ethyl-3-ethoxy propionate. The incinerator was operated at a constant 1,425 °F. Assigned a rating of "B" in the OAQPS dBASE file. (dfn014)

Crown Roll Leaf, Paterson, NJ, 8/9/88 - Performs rotogravure printing. Uses a catalytic afterburner. Methods used are not stated. Results are presented for THC as well as ethanol, acetone, methylethyl ketone, ethyl acetate, methylisobutyl ketone, and toluene. The report was not rated in the OAQPS dBASE file. Assigned a rating of "C" because of lack of detail in the report. Many pages are missing from this copy of this report. (dfn017)

Rebtex, Incorporated, Somerville, NJ, 6/18/91 - Performs textile coating. Heat setting ovens are vented to a Process Combustion Company thermal incinerator. EPA Methods 1, 2, 3, and 4 were performed along with NJAT Method 3-7. The inlet was not tested. Assigned a rating of "C" in the OAQPS dBASE file. (dfn018)

Lamart Corporation, Clifton, NJ, 11/30/90 - Adhesive backed films are produced on three coating lines. EPA Procedure T was shown to apply. Therefore, 100 percent capture is assumed in the calculations. The three enclosures are manifolded and ducted to the inlet of a Huntington Energy Systems thermal oxidizer. The Huntington Energy Systems thermal oxidizer is a regenerative heat recovery system utilizing at least three ceramic beds. The first unit preheats the inlet stream. Combustion occurs in the second unit. The third unit extracts heat from the exhaust stream. As the first bed cools, the functions of the identical units are switched so that recovered heat is available for the preheating function. EPA Methods 1, 2, 3, 3A, and 10 were performed along with NJAT Methods 3-7 and 3-9. Specific analyses were performed for isopropanol, methylethyl ketone, ethyl acetate, and toluene. The report was not rated in OAQPS dBASE file. Assigned a rating of "C" because of lack of detail in the report. (dfn019)

Dri-Print Foils Incorporated, Rahway, NJ, 10/23/91 - Produces polyester film coating. A thermal incinerator is used. This report covers the testing of AFB-2 incinerator. This report does not appear to have been in the OAQPS dBASE file. Assigned a "C" because of the lack of detail in the report probably due to the missing pages in this copy of the report. (dfn021)

Keuffel & Esser Redon Facility, Rockaway, NJ, 04/19/88 - This facility prepares specialty coated paper. All data are accurate and complete. Method 18 was used to test the outlet for acetic acid, toluene, ethyl acetate, and ethanol; however, the inlet was not tested so the destruction efficiency for these substances could not be determined. Fuel and manufacturer are the only information on the thermal incinerator. The VOC sources are Lines A-2 and T whose outlets connect before going to the incinerator. The inlet temperature is an average of the outlet of A-2 and T weighted by flow rate. Run 1 was not included because production lines stopped during testing. This was already assigned an "A" rating. (pdg1)

Apollo Metals Incorporated, Bethlehem, PA, 01/07/88 - The sources of the VOCs are two coiled sheet metal coating lines, Tower 2 and Tower 4. There was no information on the catalytic incinerator. The temperature change across the catalyst was not included. It is unclear where the percent carbon figure was calculated and where the reported number was derived from the Method 24 analysis. This test was already assigned a "B" rating. (pdg2)

Apollo Metals Incorporated, Bethlehem, PA, 07/06/88 - The sources of the VOCs are two coiled sheet metal coating lines, Tower 2 and Tower 4. The solvent usage rate reported was an average for the entire day, so individual tests may contain error due to this approximation. There was no information on the catalytic incinerator except one schematic labeled it as 5,000 dscfm. The temperature change across the catalyst is reported three times during each run. The lacquer analysis is referred to in the document so the document in hand is only part of the whole or the document does not contain the information. This report was already assigned an "A" rating for data quality. (pdg3)

Owens-Illinois Closure Incorporated, Glassboro, NJ, 11/18/87 - The source of the VOCs is Owens-Illinois Litho Coater line 029. The only VOCs tested were MIBK, m-xylene, o-xylene, p-xylene, ethyl benzene, and isophrone. In the text they claim 200-225 °F temperature change over the catalyst but the data sheets show that temperature to be 310 °F. There is not sufficient documentation on how the percentage of carbon was determined. Methods are sound but there are inconsistencies in the data. A "B" data quality rating was already assigned. (pdg4)

Pittsburgh Metal Lithographing Company, Fallsington, PA, 10/13/88 - Pages 13-70 are missing. The catalyst is referred to but it is not clear whether the incinerator is catalytic or non-catalytic, and no temperature change across the catalyst is reported. Methods for moisture, velocity, flow rate, and temperature are not mentioned so these tests were assigned a "B" data quality rating. (pdg5)

Graphic Packaging Corporation, Paoli, PA, 12/09/86 - The sources for the VOCs are Extruders Nos. 90 and 7, a flexographic press No. 67, a letter press No. 17, and an eight-station rotogravure press

No. 8; these are used for commercial packaging materials printed on paper. Temperature data are on the summary sheets but not on the data sheets. Usage rates for the applied coating are missing, and the rates reported appear to be averages that include time when the testing was not in progress. Data quality rating was already assigned as "C." (pdg6)

Constant Services Inc., 12/20/88 - Emissions from three Lembo U-type rotogravure and one laminating printer are fed into a Huntington Energy thermal incinerator. Capture efficiency calculations are missing from the document. Units on the data sheets are missing. The summation of the individual chemicals on the sheets in Appendix B is greater than the figure reported on the page marked "ink solvent content breakdown" by 6.66 percent. Xylol was used in test but not tested for. A data quality rating of "C" was already assigned to the Method 25A data, and a data quality rating of "B" was assigned to the Method 18 data because the data on the data sheets did not agree with the data on the summary page. (pdg7)

J. Josephson Incorporated, South Hackensack, NJ, 12/16/88 - The sources of the VOCs in this test are two tray and roller type laminating printers for textile, paper, plastic, and Mylar. Ink formulations not included for capture efficiency calculations. All methods are documented and the data sheets are included so an "A" data quality rating was assigned to these tests. Ink formulations are not included for capture efficiency calculations. (pdg8)

Ames Rubber Company, Hamburg, NJ, 01/04/90 - Facility electrostatically applies elastomer and adhesive to metal rolls for use in photocopiers. Eight booths are ducted to one thermal incinerator. Outlet flow rate significantly less than inlet flow rate, possibly due to poor flow distribution at sample location. Claim capture efficiency invalid because of variability but operation data seem reasonable. Design flow velocities given for each booth but insufficient data to determine total enclosure. Sample by both NJ3.7 and NJ3.9. (dfn020)

Unifoil Corporation, 02/25/93 - The sources for the VOCs in these tests are laminators Nos. 1, 2, and 4. No process data were given. No solvent application data were supplied. Temperature change across the catalyst had to be taken from temperature graphs that were not well-labeled. An "A" data rating was assigned to the supplied data, but it should be noted that data were missing for capture efficiency. (pdg9)

3M Company, Freehold, NJ, 08/08/90 - The tests were performed on the "I33 coater" and the "36 tower," both part of an adhesive tape manufacturing process. Solvent application data reported as pounds of VOC/h; the solvent was not analyzed. The methods are sound and the data test sheets are included so an "A" data quality rating was assigned. (pdg10)

General Motors Corporation, Fisher Division Trenton, NJ, 06/29/88 - Three tests were run on an autobody primer coating line. There is no solvent application rate or process rate data. An "A" data quality rating was assigned to the data that is supplied because it is accurate and all of the data sheets are included. (pdg11)

Gomar Manufacturing, Linden NJ, 12/17/91 - Polyester film is coated with red epoxy. Coating line is enclosed in a room conforming to "Procedure T" implying 100 percent capture. The flame in the drying oven uses VOC-laden air for combustion so some VOC destruction may take place before the inlet sampling location. EPA Method 25 was performed at inlet and outlet. EPA Methods 18 and 25A were performed at the outlet, making them unusable only for calculation of control device efficiency. A low audit sample was 62.6 percent higher than expected and a high audit sample was 48.4 percent lower than expected. The OAQPS dBASE rating of "A" for this report should be reconsidered in light of audit results. (cs001)

Alcan Building Products, Woodbridge, NJ, 01/04/90 - Aluminum is roll coated for construction purposes. Two coating lines, primer and topcoater, are ducted to a catalytic incinerator. Usage rates are recorded; however, limited data are available on the amount of VOC carbon in the coatings. Sampling

method was NJ 3 which requires capture of sample and subsequent analysis by FID as methane. The data indicate no separation or calibration to individual components. The closest comparison to an EPA method would therefore be EPA Method 25A. New catalyst installed at this facility not able to show required/guarantee DRE of 95 percent. (cs002)

Crown Roll Leaf, Inc., Paterson, NJ, 01/20/87 - Rotogravure printing on four separate lines ducted to the same control device. Each line has different allowable emissions, but individual device operating information is not given. Testing appears to have been for initial permit implying a new control device but this is not explicitly stated. Description of sampling was very sketchy but it appears that EPA 1-4 have been used for velocity and humidity. The report was not rated in OAQPS dBASE file. Assigned a rating of "C" because of lack of operating and sampling details. (cs003)

Union Camp Corporation, Englewood, NJ, 05/24/88 - Testing of a seven color rotogravure press by EPA Method 25A. The FID was calibrated with n-butyl acetate because this was the primary solvent. Solvent analysis was performed for n-butyl acetate but did not quantify other solvents. The catalytic incinerator went down during second test. Thermocouples were installed at the catalyst inlet and outlet but outlet temperature was illegible on the photocopy. (cs004)

Advanced Printing Technology, Inc., Morgantown, PA, 06/29/89 - Two rotogravure presses ducted to the same thermal incinerator. The incinerator was to be run at 1,500 °F but no verification data were presented. Sampling was performed per EPA Method 25A. Tedlar bag samples were also pulled for methane but details describing these locations were lacking. Though there was insufficient data to verify total enclosure, a curtained enclosure is indicated with negative pressure supported by the observation the curtains were being drawn inward during each test. Solvent usage was based on production rates and average solids laydown. The incinerator was equipped with a regenerative heat recovery system and a secondary heat recovery system. Inlet flow was higher than outlet flow in two of

the three tests, which testing company explains as being due to throttling of an induced draft fan after the incinerator but before the outlet sample point. (cs005)

Unifoil Corporation, Passaic, NJ, 11/10/87 - Three laminating lines ducted to a single catalytic incinerator. Solvent usage calculated from production rates and laydown but no solids content was available in the report. It appears they used total of unquantified compounds as solids. Testing for individual pollutants and THC by NJ 3.9. Do not meet NJ 3.9 Quality Assurance requirements. Compounds not detected in analysis were treated as zero by reviewer. Test for THC from remote sample indicates much lower inlet emissions than the sum of the component emissions. (cs006)