SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):

1. ☒ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Ed Ward, Jr.
Executive V.P. - Production
Spiralkote, Inc.
1200 Central Florida Parkway
Orlando, Florida 32809

4a. Article Number
P 832 539 860

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
7-8-91

5. Signature (Addressee)

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form **3811**, October 1990 ☆U.S. GPO: 1990—273-861 **DOMESTIC RETURN RECEIPT**

P 832 539 860

Certified Mail Receipt
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to Mr. Ed Ward, Jr. Executive V.P.-Production Spiralkote, Inc. P.O. State & ZIP Code 1200 Central Florida Parkway Orlando, FL 32809	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date mailed: 7/05/91 AC 48-192219	

PS Form **3800**, June 1990

File Copy

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT

In the matter of an
Application for Permit by:

Spiralkote, Inc.
1200 Central Florida Parkway
Orlando, Florida 32809

DER File No. AC 48-192219
Orange County

Sec'y. AC48-117138 previous permit

Enclosed is Permit Number AC 48-192219 to allow an increase in the permitted hours of operation and pollutant emissions for the facility's Olympia Model 946CI, which is a flexographic printing and coating unit, located in Orlando, Orange County, Florida, issued pursuant to Section 403, Florida Statutes.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and, by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

for James K. Pennington

C. H. Fancy, P.E., Chief
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400
904-488-1344

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of business on 7-5-91 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED,
on this date, pursuant to
§120.52(11), Florida Statutes,
with the designated Department
Clerk, receipt of which is hereby
acknowledged.

Hilda Rogers (Clerk) 7-5-91 (Date)

Copies furnished to:
C. Collins, C District
D. Nester, OCEPD
J. Guidry, P.E., PBS&I, Inc.
Reading File
Bruce Mitchell } 7-5-91 RAM

Final Determination

Spiralkote, Inc.
Orange County
Orlando, Florida

Construction Permit No.
AC 48-192219

Department of Environmental Regulation
Division of Air Resources Management
Bureau of Air Regulation

June 25, 1991

Final Determination

The construction permit application package and supplementary material have been reviewed by the Department. Public Notice of the Department's Intent to Issue was published in The Orlando Sentinel on June 6, 1991. The Revised Technical Evaluation and Preliminary Determination was distributed on May 22, 1991, and available for public inspection at the Department's Central District office and the Department's Bureau of Air Regulation office.

There were no comments received during the public notice period. Therefore, it is recommended that the construction permit be issued as drafted.

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

PERMITTEE:
Spiralkote, Inc.
1200 Central Florida Parkway
Orlando, Florida 32809

Permit Number: AC 48-192219
Expiration Date: March 31, 1992
County: Orange
Latitude/Longitude: 28°24'21"N
81°23'40"W
Project: Olympia 746 Flexographic Printing & Coating Unit & Associated Catalytic Incinerator Modification

This permit is issued under the provisions of Chapter 403, Florida Statutes, Florida Administrative Code (F.A.C.) Chapters 17-2 and 17-4, and 40 CFR (July, 1990 version). The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the modification of the Olympia Model 746 Central Impressions, which is a flexographic printing and coating unit with associated natural gas dryers: a pair of 0.8×10^6 Btu/hr overhead dryer, a pair of 0.8×10^6 Btu/hr overhead dryer, and a pair of 0.4×10^6 Btu/hr tunnel dryers. The dryers will operate at an idling level when not being used for production. The associated catalytic incinerator system will have a minimum 70% capture and transport efficiency and 95% destruction efficiency. The incinerator system was custom designed by Etter Engineering Company, Inc., and consists of three incinerators (No. 1: 2252 dscfm; No. 2: 3065 dscfm; and, No. 3: 2658 dscfm) and are natural gas fired (0.8×10^6 Btu/hr, maximum; 0.1×10^6 Btu/hr, normal) using Eclipse Model 80-AHO burners. The duct work and collection system was designed and installed by Dec-E-Tech Industrial Design Engineering. The source emits volatile organic compounds and organic solvents (used for clean-up). The UTM coordinates are Zone 17, 461.37 km East and 3142.02 km North.

The Standard Industrial Codes are: Major Group 27 - Printing/Publishing; Group No. 275 - Commercial Printing; Industrial Number 2751 - Commercial Printing, Letterpress and Screen.

The sources shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:
1. Application to Construct Air Pollution Sources, DER Form 17-1.202(1), received January 29, 1991.

Attachments cont.:

2. Mr. Bruce P. Miller's letter with enclosure ("Guidelines for Developing a State Protocol for the Measurement of Capture Efficiency") dated May 15, 1990.
3. Technical Evaluation and Preliminary Determination dated April 4, 1991.
4. Mr. E. J. Ward Jr.'s letter received April 26, 1991.
5. Revised Technical Evaluation and Preliminary Determination dated May 21, 1991.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee

GENERAL CONDITIONS:

to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

a. Have access to and copy any records that must be kept under the conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

GENERAL CONDITIONS:

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

GENERAL CONDITIONS:

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

14. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SPECIFIC CONDITIONS:

1. The source may operate continuously (i.e., 8760 hrs/yr).

2. Total maximum allowable VOC (volatile organic compounds-organic solvents) emission limit shall not exceed 60.0 pounds per "run hour" and 71.3 tons per year, including clean-up solvent less any solvent waste shipped from the source [based on a minimum 70% capture and transport efficiency and a minimum 95% destruction efficiency (oxidizes at least 95% of the VOC measured as total combustible carbon to carbon dioxide and water)]. The 12 month rolling cumulative total VOC emissions from the press shall not exceed 71.3 TPY calculated on a monthly basis. The VOC emissions will be calculated based on actual daily input and annual test results for capture and destruction. EPA Method 24A shall be utilized to determine the VOC content of the ink pursuant to F.A.C. Rule 17-2.700 and 40 CFR 60, Appendix A (July, 1990 version).

3. The maximum input to the press is 180 pounds of VOC per "run hour" calculated on a daily basis. The permitted materials are all inks, solvents and coatings similar to those stated in the application.

4. The initial and annual demonstration of the capture efficiency shall be conducted using the U.S. EPA's "Guidelines for Developing a State Protocol for the Measurement of Capture Efficiency" (attached). The permittee shall notify the Department's Central District in writing of the protocol that will be used for the capture efficiency demonstration purpose at least 60 days prior to compliance testing.

SPECIFIC CONDITIONS:

5. Initial and annual compliance tests for the actual destruction efficiency (comparison of the inlet and outlet concentrations) of the catalytic incinerator shall be conducted using EPA Method 25, pursuant to F.A.C. Rule 17-2.700 and 40 CFR 60, Appendix A (July, 1990 version). Other test methods may be used as long as prior Department approval has been granted in writing in accordance with F.A.C. Rule 17-2.700(3).

6. A material balance scheme shall be used to assess and report the annual (verifiable monthly) VOC/solvent emissions associated with clean-up. The material balance scheme will account for the VOC/solvents received, any control measures used (must be quantifiable), and any VOC/solvents shipped off the facility by a properly licensed hauler.

7. The Department's Central District office shall be notified in writing at least 15 days prior to conducting compliance tests pursuant to F.A.C. Rule 17-2.700(2).

8. Test reports shall be submitted to the Department's Central District office no later than 45 days after the last sampling run of each test is completed pursuant to F.A.C. Rule 17-2.700(7).

9. This project is subject to all applicable provisions of F.A.C. Chapters 17-2 and 17-4 and 40 CFR (July, 1990 version).

10. The sources are subject to the applicable provisions of F.A.C. Rules 17-2.240: Circumvention; 17-2.250: Excess Emissions; and, 17-4.130: Plant Operation-Problems.

11. Objectionable odors shall not be allowed off plant property pursuant to F.A.C. Rules 17-2.620(2) and 17-2.600(1)(a)2.

12. Pursuant to F.A.C. Rule 17-2.600(1)(a)1., the catalytic incinerator is subject to the visible emissions standard of "no visible emissions" (5% opacity) except that visible emissions not exceeding 20% opacity are allowed for up to three minutes in any one hour period. Initial and annual compliance tests shall be conducted using DER Method 9 pursuant to Table 700-1, F.A.C. Rule 17-2.700.

13. An annual operating report shall be submitted to the Department's Central District office by March 1 of each calendar year accounting for the annual VOC/solvent emissions, which shall minimally include source test results, quantifiable fugitives and clean-up VOCs/solvents.

SPECIFIC CONDITIONS:

14. Any change in the method of operation pursuant to F.A.C. Rule 17-2.100, Definitions-Modification, the permittee shall submit an application and the appropriate processing fee to the Bureau of Air Regulation office.

15. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Department's Bureau of Air Regulation office prior to 60 days before the expiration date of the permit (F.A.C. Rule 17-4.090).

16. An application for an operation permit must be submitted to the Department's Central District office at least 90 days prior to the expiration date of this construction permit. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed while noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rules 17-4.055 and 17-4.220).

Issued this 3rd day
of July, 1991

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

STEVE SMALLWOOD, P.E., Director
Division of Air Resources
Management

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee	
To:	Location:
To:	Location:
To:	Location:
From:	Date:

Interoffice Memorandum

TO: Steve Smallwood

FROM: Clair Fancy CF

DATE: June 25, 1991

SUBJ: Approval of Construction Permit No. AC 48-192219
Spiralkote, Inc.

Attached for your approval and signature is a construction permit for a modification prepared by the Bureau of Air Regulation (BAR) for the above referenced company to allow an increase in the permitted hours of operation and pollutant emissions for the facility's Olympia Model 946CI, which is flexographic printing and coating unit. The facility is located in Orlando, Orange County, Florida. There were no comments received during the public notice period.

Day 90, after which this permit will be issued by default, is July 11, 1991.

I recommend your approval and signature.

CF/BM/rbm

BM 1-3-91

Check Sheet

Company Name: Spinaltek, Inc.
Permit Number: AC 48-192219
PSD Number:
Permit Engineer: Bruce Mitchell

Application:

- ☑ Initial Application
  - ☐ Incompleteness Letters
  - ☐ Responses
  - ☐ Waiver of Department Action
  - ☐ Department Response
  - ☐ Other

Cross References:
- ☑ A048-137831
- ☐ A048-146002
- ☐ AC48-157290

Intent: & Revised

- ☑ Intent to Issue
- ☐ Notice of Intent to Issue
- ☑ Technical Evaluation
- ☐ BACT or LAER Determination
- ☑ Unsigned Permit
  - Correspondence with:
    - ☐ EPA
    - ☐ Park Services
    - ☐ Other
- ☐ Proof of Publication
  - ☐ Petitions - (Related to extensions, hearings, etc.)
  - ☐ Waiver of Department Action
  - ☐ Other

missing Attachment #2 Mr. Bruce Miller's letter dated 5/16/1990 & enclosures "Guidelines for developing a State protocol for the Measurement of Capture Efficiency"

Final Determination:

- ☑ Final Determination
- ☑ Signed Permit
- ☐ BACT or LAER Determination
  - ☐ Other

Post Permit Correspondence:

- ☐ Extensions/Amendments/Modifications
- ☑ Other

6/22/92

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

In the matter of:	)	Permit Nos. AC 48-192219
	)	AC 48-157290
fp Spiralkote, Inc.,	)	
	)	ASP-91-P-01
Petitioner.	)	
	)	OGC File No. 92-0436

ORDER ON REQUEST
FOR
ALTERNATE TEST PROCEDURES AND REQUIREMENTS

Pursuant to Rule 17-2.700(3), Florida Administrative Code, fp Spiralkote, Inc., petitioned for approval to reduce the duration of the required VOC capture efficiency tests for the 52" WH2 746 ST Olympia 746 ST Six Color Press [Permit No. AC 48-157290] and the 36" Olympia 746 Central Impressions Press [Permit No. AC 48-192219], which are located in Orange County.

Having considered Petitioner's written request and all supporting documentation, the following Findings of Fact, Conclusions of Law, and Order are entered:

FINDINGS OF FACT

1. On October 31, 1991, Petitioner specifically requested approval to reduce the duration of each VOC capture efficiency sampling run for the 52" WH2 746 ST Olympia 746 ST Six Color Press [Permit No. AC 48-157290] and the 36" Olympia 746 Central Impressions Press [Permit No. AC 48-192219] from eight hours to one hour.

2. As justification for the request, Petitioner states, "We are unable to sustain 8 hours of continuous operation at maximum capacity. Due to the nature of our business, only 9 hours of most 24 hour days are 'run hours' during which ink and solvent is being applied to paper, even though our presses are manned 24 hours a day. This is documented in our application. It should be noted that even this 9 hours of run time occurs in 45 minute to 90 minute intervals which is the run time of a roll of paper" [Exhibit 1].

3. Pursuant to Rule 17-2.700, F.A.C., and the EPA's April 16, 1990 memo, "Guidelines for Developing a State Protocol for the Measurement of Capture Efficiency", which has been

adopted-by-reference, the minimum sampling time for each capture efficiency run is to be eight hours.

4. On December 19, 1991, the Region IV office of the U.S. EPA stated, "We have determined that reducing the sampling time for each of the capture efficiency test runs to 1 hour is not acceptable because of problems with test repeatability for runs of this duration. However, it would be acceptable for Spiralkote to reduce the minimum time for each test run from 8 hours to 3 hours [Exhibit 2].

CONCLUSIONS OF LAW

1. The Department has jurisdiction to consider Petitioner's request pursuant to Section 403.061, Florida Statutes, and Rule 17-2.700(3), Florida Administrative Code.

2. The Department retains the right to require a sampling time of at least eight hours for each capture efficiency test run pursuant to Table 700-1 of 17-2.700, Florida Administrative Code, if, after investigation, it is not possible to assess the compliance status of the affected source(s).

3. Petitioner has provided reasonable justification to reduce the minimum duration of each capture efficiency test run to less than eight hours.

ORDER

Having considered Petitioner's written request and supporting documentation, it is hereby ordered that:

1. Petitioner's request for a reduction in the duration of each capture efficiency test run from eight hours to one hour is denied; however, the Department authorizes the petitioner to reduce the duration of each capture efficiency test run to three hours;

2. Petitioner shall conduct the capture efficiency tests using the procedures specified in Rule 17-2.700, Florida Administrative Code;

3. Petitioner shall conduct the capture efficiency tests prior to the expiration of the construction permit and annually thereafter; and

4. Petitioner shall submit the compliance test report to the Air Program Manager for the Orange County Environmental Protection Department and the Air Program Administrator for the Department of Environmental Regulation's Central District office.

RIGHT TO APPEAL

Any party to this Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date the Notice of Agency Action is filed with the Clerk of the Department.

PETITION FOR ADMINISTRATIVE REVIEW

1. A person whose substantial interests are affected by the Department's decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within 21 days of receipt of this Order. The petitioner shall mail a copy of the petition to the applicant at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

2. The petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, and the Department File Number;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by each petitioner, if any;

(e) A statement of facts which each petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes each petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by each petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

3. If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Order. Persons whose substantial interests will be affected by any decision of the Department with regard to the applicant have the right to petition to become a party to the proceeding. The petition must conform with the requirements specified above and be filed (received) within 21 days of receipt of this notice in the Office of General Counsel at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes, and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, Florida Administrative Code.

4. This Order constitutes final agency action unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, Florida Administrative Code. Upon timely filing of a petition or a request for an extension of time, this Order will not be effective until further Order of the Department.

DONE AND ORDERED this 22 day of June, 1992 in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

CAROL M. BROWNER
Secretary
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

(904) 488-4805

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true copy of the foregoing Order has been mailed, postage prepaid, to Ed Ward, Jr., Executive Vice President - Production, Spiralkote, 1200 Central Florida Parkway, Orlando, Florida 32821-9295, this 25th day of June, 1992.

GARY C. SMALLRIDGE
Assistant General Counsel

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Telephone (904) 488-9730

ACE
AIR CONSULTING
& ENGINEERING, INC.

2106 N.W. 67th Place • Suite 4 • Gainesville, Florida • 32606
(904) 335-1889 FAX (904) 335-1891

December 23, 1991

Mr. Jim Pennington
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

RE: SPIRALKOTE, INC. - REQUEST FOR ASP AND FDER COMPLETENESS LETTER DATED NOVEMBER 19, 1991

Dear Mr. Pennington:

Enclosed is the information you requested in the above referenced letter. If you have any additional questions, please contact.

I apologize for our delay in submitting this data, but Mr. Ward was on an extended trip.

Respectfully,

AIR CONSULTING AND ENGINEERING, INC.

Stephen L. Neck

Stephen L. Neck, P.E.

SLN:ctg

enclosures

cc: Mr. Ed Ward, Spiralkote, Inc.
Mr. Bruno Ferraro, Grove Scientific, Inc.

ACE FILE: 2009100

Exhibit 1

SINCE 1934

fp Spiralkote, Inc.

A Subsidiary Of Fleming Packaging Corporation

December 12, 1991

Steve Neck
AIR CONSULTING AND ENGINEERING
2106 N.W. 67th Place
Suite 4
Gainesville, Florida 32606

Dear Steve:

This letter authorizes you to request an alternate sampling procedure for the testing protocol on our WHI printing press (permit #AC48-192219) and our WHII printing press (Permit AC48-157290).

As discussed, in our attached letter of 6/13/91 to Alex Alexander, we are unable to sustain 8 hours of continuous full load. We can only achieve full load and still maintain sellable quality on the best running hours of the best running days of the best running jobs, which contain high solvent loadings.

We can simulate these conditions for intervals of an hour or two but not continuously because <u>our process is not continuous.</u>

1st: Each roll of paper last one to two hours depending on speed. 75% of the time we must stop 15 to 20 minutes at the end of each roll for quality adjustments and minor maintenance.

2nd: We print 624 different orange juice label jobs per year; an average of 52 per month and 2.5 per day.

3rd: Paper breaks are another reason for discontinuous running.

4th: Each job takes 6 hours to set up and 1 to 5 hours to print.

Dennis Nester or Dale Maclarity of Orange County can verify the near impossibility of 8 hour tests at our facility.

1200 CENTRAL FLORIDA PARKWAY ORLANDO, FLORIDA 32821-9295 TELEPHONE (407) 859-7780 FAX (407) 857-0430

Source Descriptions:

1.) AC48-157290

52" WH2 746 ST Olympia Flexorex Press

This is 52" Wide Flexo Printing press consisting of a six color central impression printing drum and an attached downstream coater. There are two incinerators attached to the press. One controls the captured solvent from the 6 printing decks. The second incinerator controls the captured solvent from the coater deck.

The press prints frozen orange juice labels and shopping bags.

2.) AC48-192219

36" WHI 746CC Olympia Flexorex Press

This 36" wide flexo printing press consists of a six color central impression printing drum and two attached down stream coaters. There are three incinerators attached to the press. One controls the captured solvent from the 6 printing decks. The second incinerator controls the captured solvent for the 1st downstream coater. The 3rd incinerator controls the captured solvent from either the 2nd coater deck (0%) or the 52" coater deck (100% of the time). As a result, the 2nd coater deck is unused 99% of time) on runs on waterbase inks and coatings 1% of time.

Call Ed Ward at (407) 859-7780 if you have any questions.

Sincerely,

Ed Ward

ED WARD

EW/jm

cc: James Pennington, Clair Fancy, Charles Collins, Gary Kuberski, Dennis Nester

5. Specific condition 10 .

Modify the referenced capture efficiency test methods from 3 eight hour tests to 3 test runs of 1 hour duration after the system has reached a steady state. This ussually takes about 20 minutes in our building. The enclosed table I documents trials that show the fugitive, captured and stack emissions of VOC, measured by fid, are stable after 20 minutes of run time.

We ask for this modification because: 1. We are unable to sustain 8 hours of continuous run at maximum capactiy. Due to the nature of our business, only 9 hours of most 24 hr days are "run hours" during which ink and solvent is being applied to the paper, even thou our presses are manned 24 hours a day. This is documented in our application. It should be noted that even this 9 hours of run time occurs in 45 minute to 90 minute intervals which is the runtime of a roll of paper. Please consult with Dennis Nester or Dale Maclarty of the Orange County (407-836-7400). They are the official observers of mosts of our previous compliance tests. I think they will verify the extreme difficulty of conducting accurate continous 8 hour tests.

If you have any questions please call.

E J Ward Jr

E. J. Ward Jr.
VP-production
FP Spiralkote
Phone 407-859-7780

This request was sent to Alex Alexander 6/13/91. He explained, by phone, that he could not approve the alternate sampling procedure. He said we would have to pursue this through your office.

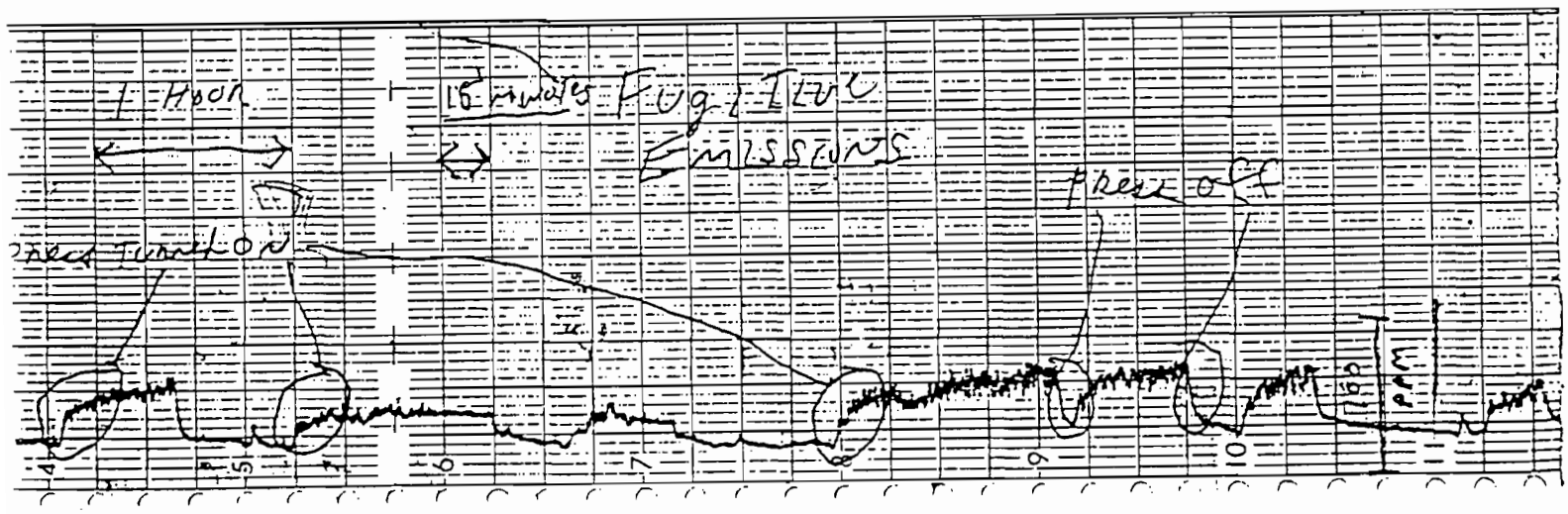
8:25 am to 9:47 AM
3-27-91
Job 23111
morning delight ten count bisquit texas buttermilk

minute	inlet ppm	outlet ppm	
1	1500	110	92.7%
2	1500	118	92.1%
3	1600	117	92.7%
4	1700	117	93.1%
5	1800	117	93.5%
6	1800	117	93.5%
7	1900	117	93.8%
8	1900	115	93.9%
9	1900	114	94.0%
10	1900	112	94.1%
11	1900	102	94.6%
12	1900	90	95.3%
13	2000	85	95.8%
14	2000	80	96.0%
15	2000	70	96.5%
16	2000	48	97.6%
17	2100	48	97.7%
18	2100	48	97.7%
19	2100	48	97.7%
20	2100	48	97.7%
21	2100	48	97.7%
22	2200	48	97.8%
23	2000	48	97.6%
24	2000	48	97.6%
25	2000	48	97.6%
26	2000	45	97.8%
27	2000	45	97.8%
28	2000	45	97.8%
29	2000	45	97.8%
30	2100	40	98.1%
31	2000	40	98.0%
32	2000	40	98.0%
33	2300	40	98.3%
34	2100	35	98.3%
35	2000	35	98.3%
36	2000	35	98.3%
37	2100	35	98.3%
38	1900	35	98.2%
39	1900	35	98.2%
40	2000	32	98.4%
41	2000	32	98.4%
42	2000	32	98.4%
43	2000	32	98.4%
44	2100	32	98.5%
45	2000	32	98.4%
46	1900	32	98.3%

47	2000	32	98.4%			
48	2100	32	98.5%			
49	1900	35	98.2%			
50	2000	35	98.3%			
51	2100	35	98.3%			
52	2100	35	98.3%			
53	2100	35	98.3%			
54	2100	35	98.3%			
55	2100	35	98.3%			
56	2000	35	98.3%			
57	2000	35	98.3%			
58	2000	32	98.4%			
59	1900	32	98.3%			
60	1900	32	98.3%	1978	55	97.1%
61	2000	55	97.3%			
62	2100	32	98.5%			
63	2200	32	98.5%			
64	2100	32	98.5%			
65	2100	35	98.3%			
66	2200	35	98.4%			
67	2000	35	98.3%			
68	2000	35	98.3%			
69	2000	35	98.3%			
70	2000	35	98.3%			
71	2000	35	98.3%			
72	2100	35	98.3%			
73	2100	35	98.3%			
74	2100	35	98.3%			
75	2000	35	98.3%			
76	2000	35	98.3%			
77	2000	32	98.4%			
78	1900	32	98.3%			
79	1900	32	98.3%			
80	2000	32	98.4%			
81	2000	35	98.3%			
82	1900	35	98.2%	1993	50	97.4%

end of roll

	average 60 min	average 82 min
inlet ppm leveled off at 13 minutes at 1900 to 2100	1978	1993
outlet leveled off at 34 minutes at 32-35	55	50
% destruction leveled off at 33 minutes at 98.3%	97.1 %	97.4 %



2.5 Test Run Intervals

Protocols G.1 and F.2 are specified to be three 8-hour test runs, unless otherwise approved. This time period is not practical for the subject operation. Typical operations are 1-3 hours of press time per an approximate six hours down-time during new job reconfiguration. In addition, most jobs require a solvent usage of much less than the 180 lb/Hr VOC usage desired for testing. To accurately simulate maximum production, press run time should be held to a minimum. In-house VOC measurements have shown that all fugitive emission sources as well as incinerator inlet and outlet concentrations reach steady-state in about 15 minutes from press start-up. It is suggested that three test runs of one-hour duration each be made as quickly as possible after the 15 minute time period. This will aid to avoid inaccuracies caused by the

---

inevitable press stoppages due to paper changes, etc., encountered in long run periods. The testing scenario would proceed as follows:

1. Weigh-up all inks and varnishes to be used in testing.
2. Deploy inks and varnishes to press.
3. Run press for 15-20 minutes to stabilize conditions (confirm with EPA Method 25A).
4. Run three 60-minute capture and destruction efficiency test.
5. Shut down press. Collect unused material and determine total material usage rate.
6. Retain samples for EPA Method 24 analysis.

Florida Department of Environmental Regulation
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400
Lawton Chiles, Governor
Carol M. Browner, Secretary

November 19, 1991

Mr. Stephen L. Neck, P.E.
Air Consulting and Engineering
2106 N.W. 67th Place
Suite 4
Gainesville, Florida 32606

Re: Spiralkote - Request for Exception and Approval of An Alternative Procedure

Dear Mr. Neck:

We have received the above referenced request for approval of an alternate sampling procedure. A copy of your request has been forwarded for comment to the Region IV Office of the U.S. EPA, the Department's district offices, and Department-approved local programs. We expect to act on the request within about 90-days after receiving the requested comments.

In order to continue the review of your request, we will also need the following information:

- A letter from the company authorizing you to request this particular alternate sampling procedure.
- A list of the affected construction and operation permit numbers.
- A description of the affected source(s).
- A complete copy of Section 2.5 of your proposed test protocol. The copy provided with your letter of October 31, 1991, was not complete.

The proposal to conduct concurrent EPA Method 25 and EPA Method 25A sampling at the incinerator outlets has been reviewed. For compliance, the determination of VOC destruction efficiency will be based solely on the results of EPA Method 25. The results of simultaneous EPA Method 25A sample runs will not influence the acceptability of the results obtained with EPA Method 25.

Please include the information required by Rule 17-2.700(3)(b), F.A.C. [Exceptions and Approval of Alternate Procedures and Requirements], in the sequential order outlined by the rule in future requests for approval of alternate sampling procedures. Supplemental documentation which includes a letter of authorization from the owner or operator of the source should also be enclosed.

If you have any questions on the above, please call either me or Mike Harley at (904) 488-1344.

Sincerely,

James K. Pennington, P.E.
Administrator
Compliance and Enforcement Section
Bureau of Air Regulation

JKP\mdh

cc: Clair Fancy
Charles Collins
Gary Kuberski
Dennis Nester

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

DEC 19 1991

4APT-AEB

Mr. James K. Pennington, P.E., Administrator
Compliance and Enforcement Section
Bureau of Air Regulation
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Review of Alternative Sampling Procedure Submitted by Spiralkote, Inc., Orange County, Florida

Dear Mr. Pennington:

As requested in your letter of November 20, 1991, an alternative sampling proposal from the referenced facility has been reviewed. Spiralkote requested approval to reduce the sampling time for volatile organic compound (VOC) capture efficiency test runs from 8 hours to 1 hour because the length of typical production runs for the press being tested ranges from 1 to 3 hours.

We have determined that reducing the sampling time for each of the capture efficiency test runs to 1 hour is not acceptable because of problems with test repeatability for runs of this duration. However, it would be acceptable for Spiralkote to reduce the minimum time for each test run from 8 hours to 3 hours. The basis for approval of this reduction in test duration is that, in conjunction with the development of VOC capture efficiency testing methods that will be added to Appendix M of 40 C.F.R. Part 51, EPA has determined that acceptable test repeatability can be obtained if testing is conducted over an entire press run that is not less than 3 hours in length. Since the alternative test method proposal from Spiralkote indicates that typical press runs range from 1 to 3 hours, it should be possible for the company to schedule testing during press runs that will last at least 3 hours.

Exhibit II

If you have any questions about the determination provided in this letter please contact Mr. David McNeal of my staff at 404/347-5014.

Sincerely yours,

Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides and Toxics
Management Division

```
AIR020 300RG480125        AIR PROGRAM INFORMATION SYSTEM                10/30/91
                            FACILITY INFORMATION SCREEN                 10:20:33
                                                      LAST UPDATED: 08/07/90

  STATUS: A = ACTIVE    DATE OF PERMANENT SHUTDOWN: __ / __ / __   # OF SRC: 011
OWN/COMP: SPIRALKOTE
NAME/LOC: 1200 CENTRAL FLORIDA PKWY                     ZIP CODE: 32809
    CITY: ORLANDO                    CITY CODE: 3280   MAJOR FAC? Y (Y OR N)
    TYPE: 36 = GRAPHICS ARTS/PRINTING                  SYN MINOR? _ (Y OR N)
UTM ZONE: 17  EAST: 461 . 4  (KM)   NORTH: 3142 . 1  (KM)
LATITUDE: 28 : 33 : 08              LONGITUDE: 81 : 21 : 05
     CDS: 1 = A1A   VOC: 1 = A1A          RFP? _ (Y OR N)

   DATE OF FINAL COMPLIANCE: 08/13/91

 COMMENT: PRINTING_PRESS_____________________________________________



CREATE HISTORY RECORD ? _
                                                ACTION TAKEN: _
AIR021 300RG480125        AIR PROGRAM INFORMATION SYSTEM                10/30/91
                          FACILITY OWNER/CONTACT SCREEN                 10:28:51

FACIL: OWN: SPIRALKOTE          N/L: 1200 CENTRAL FLOR   FACIL UPDATED:08/07/90
     # SRC: 011  MAJOR FAC: Y   CITY: ORLANDO          FAC STATUS: A = ACTIVE

            *****     OWNER/REPRESENTATIVE INFORMATION     *****
      NAME: FLEMING PACKAGING CORP_________________
  ORG/FIRM: SPIRALKOTE,_INC._(SUDSIDIARY OF)_______
   ADDRESS: 1200_CENTRAL_FLORIDA_PKWY
      CITY: ORLANDO_____________
        ST: FL                        ZIP CODE: 32809 - ____
     PHONE: ( 407 ) 859 - 7780

            *****     FACILITY CONTACT INFORMATION     *****
      NAME: MR. ED WARD, JR._____________________
  ORG/FIRM: SPIRALKOTE, INC._____________________
   ADDRESS: 1200 CENTRAL FLORIDA PKWY
      CITY: ORLANDO_____________
        ST: FL                        ZIP CODE: 32809 - ____
     PHONE: ( 407 ) 859 - 7780

                                      ACTION TAKEN: U  TRANSMIT HERE: _
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BEST AVAILABLE COPY

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AIR030 300RG48012510      AIR PROGRAM INFORMATION SYSTEM              10/30/91
                            SOURCE INFORMATION SCREEN                  10:37:51
FACIL: OWN: SPIRALKOTE           N/L: 1200 CENTRAL FLOR SOURCE UPDATED: 10/29/91
     # SRC: 011   MAJOR FAC? Y    CITY: ORLANDO                  STATUS: A = ACTIVE

           *****      CONSTRUCTION PERMIT/PPS INFORMATION      *****
   PERMIT #: AC48 - 192219_   PPS #: ____ - __     FEE PAID: ___200 (PERMIT ONLY)
DATE ISSUED: 07 / 03 / 91     DATE EXPIRES: 03 / 31 / 92    HISTORY? _  (Y OR N)
              *****     OPERATION PERMIT INFORMATION      *****
   PERMIT #: ____ - _______      FEE PAID: ______      AOR REQUIRED? _  (Y OR N)
DATE ISSUED: __ / __ / __     DATE EXPIRES: __ / __ / __    HISTORY? _  (Y OR N)
         *****    SOURCE DESCRIPTION/TRACKING INFORMATION      *****
  DESC: OLYMPIC_746_FLEXOGRAPHIC_PRINTING_&_COATING_UNIT_____________
SIMILAR SRC ID(S): __ __ __ __ __ __
                   __ __ __ __ __ __
STATUS: A = ACTIVE     # OF SCC: 002  # OF POLLUTANT: 001  MAJOR SRC? _ (Y OR N)
INITIAL CONST/MOD DATE: 07 / 03 / 91       TYPE: 47 = PAPER
 SIC: 2711 = NEWSPAPER PRINT/PUBLISH                        ESC NSR? _ (Y OR N)
NSPS: ___    NESHAP: ___    111D: ___   PSD/NSR: ___    NAA/NSR: ___   RACT: VOC
COMMENT: MODIFICATION-INCREASE_IN_PERMITTED_EMISSIONS_AND_OPERATION__
         HOURS______________________________________________________
START UP DATE: __ / __ / __              SHUT DOWN DATE: __ / __ / __
MORE SRC RECORDS ON FILE? YES                     ACTION TAKEN: U  TRANSMIT HERE: _
```

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AIR023 300RG480125           AIR PROGRAM INFORMATION SYSTEM             10/30/91
                                 FACILITY QUICK LOOK                    10:40:38
FACIL: OWN: SPIRALKOTE          N/L: 1200 CENTRAL FLOR LAST FACIL UPDT:10/30/91
       SRC: 011   MAJOR FAC: Y  CITY: ORLANDO              STATUS: A = ACTIVE

SRC #: 09 DESC: KIDDER PAINTING PRESS #3                                  [ _ ]
 PERMIT/PPS#: .... - ......./A048 - 132812    MAJOR SRC: .  STATUS: I = INACTIVE
   NSPS: ...    NESHAP: ...    111D: ...    PSD: ...    NAA/NSR: ...    RACT: ...
SRC #: 10 DESC: OLYMPIC 746 FLEXOGRAPHIC PRINTING & COATING UNIT          [ _ ]
 PERMIT/PPS#: AC48 - 192219 /.... - .......  MAJOR SRC: .  STATUS: A = ACTIVE
   NSPS: ...    NESHAP: ...    111D: ...    PSD: ...    NAA/NSR: ...    RACT: VOC
SRC #: 11 DESC: W&H FLEXOREX CC746 PRINTING PRESS                         [ _ ]
 PERMIT/PPS#: AC48 - 157290 /.... - .......  MAJOR SRC: .  STATUS: C = CONSTRCT
   NSPS: ...    NESHAP: ...    111D: ...    PSD: ...    NAA/NSR: ...    RACT: ...
SRC #: .. DESC: ..................................................        [ _ ]
 PERMIT/PPS#: .... - ......./.... - .......  MAJOR SRC: .  STATUS: . = ........
   NSPS: ...    NESHAP: ...    111D: ...    PSD: ...    NAA/NSR: ...    RACT: ...

MORE SOURCES ON FILE ? NO

                                          ACTION TAKEN  _  TRANSMIT HERE  _
```

```
AIR032 300RG48012510       AIR PROGRAM INFORMATION SYSTEM               10/30/91
                             SOURCE SCHEDULE/RATE RECORD                10:41:36
                                                          LAST UPDATED: 10/30/91
FACIL: OWN: SPIRALKOTE          N/L: 1200 CENTRAL FLOR
     # SRC: 011  MAJOR FAC: Y  CITY: ORLANDO                STATUS: A = ACTIVE
  SRC DESC: OLYMPIC 746 FLEXOGRAPHIC PRINTING & COATING UNIT
  PERMIT/PPS: AC48 - 192219           MAJOR SRC: .          STATUS: A = ACTIVE
     NSPS: ...    NESHAP: ...    111D: ...    PSD: ...    NAA/NSR: ...    RACT: VOC


              *****      OPERATING SCHEDULE INFORMATION      *****
   TYPICAL OPERATING SCHEDULE: 24 (HR/DAY) 7  (DAY/WK) 52 (WK/YR)
TYPICAL % OPERATION BY SEASON: 25 (DJF)    25 (MAM)    25 (JJA)    25 (SON)
 PERMITTED OPERATING SCHEDULE: 24 (HR/DAY) 7  (DAY/WK) 52 (WK/YR) 8760 (HR/YR)
[illegible] OPERATING SCHEDULE: 21 (HR/DAY) 6  (DAY/WK) 52 (WK/YR) 6420 (HR/YR)
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 PERMITTED OPERATING SCHEDULE: 24 (HR/DAY) 7  (DAY/WK) 52 (WK/YR) 8760 (HR/YR)
AOR YR: 90 OPERATING SCHEDULE: 24 (HR/DAY) 5  (DAY/WK) 52 (WK/YR) 6420 (HR/YR)

                  *****     OPERATING RATE INFORMATION     *****
MAX HEAT INPUT RATE: _______ (MMBTU/HR) FOR BOILERS
   MAX PROCESS RATE: 0000180 UNITS: LBS/RUN HOUR
MAX PRODUCTION RATE: _______ UNITS: _______________

                                          ACTION TAKEN: _ TRANSMIT HERE: _


AIR033 300RG48012510       AIR PROGRAM INFORMATION SYSTEM              10/30/91
                           SOURCE EMISSION POINT RECORD                10:49:24
FACIL: OWN: SPIRALKOTE          N/L: 1200 CENTRAL FLOR SRC LAST UPDATED: 10/30/91
     # SRC: 011  MAJOR FAC: Y   CITY: ORLANDO             STATUS: A = ACTIVE
SRC DESC: OLYMPIC 746 FLEXOGRAPHIC PRINTING & COATING UNIT
PERMIT/PPS #: AC48 - 192219           MAJOR SRC: .        STATUS: A = ACTIVE
     NSPS: ...   NESHAP: ...   111D: ...   PSD: ...   NAA/NSR: ...   RACT: VOC

                  *****     EMISSION POINT INFORMATION     *****
EMISSION POINT TYPE: 1 = SINGLE POINT
STACK HEIGHT: 030 (FT)          EXIT DIA: 01 . 3 (FT)        EXIT TEMP: 0400 (F)
ACTUAL VOLUME FLOW RATE: 0002500 (ACFM)  DRY STANDARD FLOW RATE: 0001504 (DSCFM)
EXIT VEL: 0031 (FT/SEC)   NONSTK EMIS HT: 0000 (FT)  BLDG HT: ____ WD: ____ (FT)
POINT UTM:  EAST: 461 . 04 (KM)    NORTH: 3142 . 01 (KM)   GEP STK HT:  ___ (FT)
COMMENT: ____________________________________________________________

                  *****     CONTROL EQUIPMENT INFORMATION     *****
CONTROL A: THREE CATALYTIC INCINERATORS
CONTROL B: ____________________________________________________________
CAPITAL COST: A $ ________  B $ ________     ANNUALIZED CONTROL COST: $ ________

                                          ACTION TAKEN: _  TRANSMIT HERE: _


AIR034 300RG48012510      AIR PROGRAM INFORMATION SYSTEM                 10/30/91
                               SOURCE SCC RECORD                         10:50:45
FACIL: OWN: SPIRALKOTE           N/L: 1200 CENTRAL FLOR    SCC UPDATED: 10/29/91
     # SRC: 011  MAJOR FAC: Y   CITY: ORLANDO           FAC STATUS: A = ACTIVE
SOURC DESC: OLYMPIC 746 FLEXOGRAPHIC PRINTING & COATING UNIT
PERMIT/PPS: AC48 - 192219           MAJOR SRC: .        SRC STATUS: A = ACTIVE
 NSPS: ...    NESHAP: ...    111D: ...    PSD: ...    NAA/NSR: ...    RACT: VOC

 SCC NO: 4 - 02 - 008 - 01          40200801
DESCRIP: ORGANIC SOLVENT   SURFACE COATING   COATING OVEN      GENERAL

 MAX HOURLY RATE:     0 . 040     HOURLY RATE LIMIT: ____ . ___
 EST ANNUAL RATE:     277         ANNUAL RATE LIMIT: _______
 RATE UNITS: TONS COATING
 MAX:  % S: _ . __   % ASH: __ . _   MMBTU/UNITS ABOVE: _____  %S LIMIT: _ . __

 ACTUAL FOR AOR YEAR: 90          ANNUAL RATE/UNITS ABOVE: .......
 AVG:  % S: . . ..   % ASH: .. . .   MMBTU/UNITS ABOVE: .....

 COMMENTS: 71.3 TPY (VOC + ORG. SOLVENTS) ALLOWED: (60.0 LBS/RUN HR)

MORE SOURCE SCC'S ON FILE? YES              ACTION TAKEN: _   TRANSMIT HERE: _


AIR038 300RG48012510 000 _   AIR PROGRAM INFORMATION SYSTEM            10/30/91
                             SOURCE PSD RECORD                         10:51:58
FACIL: OWN: SPIRALKOTE          N/L: 1200 CENTRAL FLOR LAST PSD UPDATED: ........
    # SRC: 011  MAJOR FAC: Y  CITY: ORLANDO             STATUS: A = ACTIVE
SRC DESC: OLYMPIC 746 FLEXOGRAPHIC PRINTING & COATING UNIT
PERMIT/PPS: AC48 - 192219           MAJOR SRC: .        STATUS: A = ACTIVE
```

```
                *****     EMISSION POINT INFORMATION     *****
EMISSION POINT TYPE: 1 = SINGLE POINT
STACK HEIGHT: 030 (FT)          EXIT DIA: 01 . 3 (FT)          EXIT TEMP: 0400 (F)
ACTUAL VOLUME FLOW RATE: 0002500 (ACFM)  DRY STANDARD FLOW RATE: 0001504 (DSCFM)
EXIT VEL: 0031 (FT/SEC)   NONSTK EMIS HT: 0000 (FT)  BLDG HT: ____ WD: ____ (FT)
POINT UTM:  EAST: 461 . 04 (KM)    NORTH: 3142 . 01 (KM)   GEP STK HT:  ___ (FT)
COMMENT: ____________________________________________________________

                *****     CONTROL EQUIPMENT INFORMATION     *****
CONTROL A: THREE CATALYTIC INCINERATORS
CONTROL B: ____________________________________________________________
CAPITAL COST: A $ ________  B $ ________     ANNUALIZED CONTROL COST: $ ________

                                          ACTION TAKEN: _  TRANSMIT HERE: _


AIR034 300RG48012510     AIR PROGRAM INFORMATION SYSTEM                  10/30/91
                              SOURCE SCC RECORD                          10:50:45
FACIL: OWN: SPIRALKOTE          N/L: 1200 CENTRAL FLOR    SCC UPDATED: 10/29/91
     # SRC: 011  MAJOR FAC: Y   CITY: ORLANDO           FAC STATUS: A = ACTIVE
SOURC DESC: OLYMPIC 746 FLEXOGRAPHIC PRINTING & COATING UNIT
PERMIT/PPS: AC48 - 192219          MAJOR SRC: .          SRC STATUS: A = ACTIVE
 NSPS: ...    NESHAP: ...    111D: ...    PSD: ...    NAA/NSR: ...    RACT: VOC

 SCC NO: 4 - 02 - 008 - 01          40200801
DESCRIP: ORGANIC SOLVENT   SURFACE COATING   COATING OVEN      GENERAL

 MAX HOURLY RATE:    0 . 040     HOURLY RATE LIMIT: ____ . ___
 EST ANNUAL RATE:     277        ANNUAL RATE LIMIT: _______
 RATE UNITS: TONS COATING
 MAX:  % S: _ . __   % ASH: __ . _   MMBTU/UNITS ABOVE: _____  %S LIMIT: _ . __

 ACTUAL FOR AOR YEAR: 90          ANNUAL RATE/UNITS ABOVE: .......
 AVG:  % S: . . ..   % ASH: .. . .   MMBTU/UNITS ABOVE: .....

 COMMENTS: 71.3 TPY (VOC + ORG. SOLVENTS) ALLOWED: (60.0 LBS/RUN HR)

MORE SOURCE SCC'S ON FILE? YES              ACTION TAKEN: _   TRANSMIT HERE: _


AIR038 300RG48012510 000 _   AIR PROGRAM INFORMATION SYSTEM             10/30/91
                              SOURCE PSD RECORD                          10:51:58
FACIL: OWN: SPIRALKOTE          N/L: 1200 CENTRAL FLOR LAST PSD UPDATED: ........
    # SRC: 011  MAJOR FAC: Y  CITY: ORLANDO            STATUS: A = ACTIVE
SRC DESC: OLYMPIC 746 FLEXOGRAPHIC PRINTING & COATING UNIT
PERMIT/PPS#: AC48 - 192219         MAJOR SRC:           STATUS: A = ACTIVE
     NSPS:        NESHAP:       111D:       PSD:       NAA/NSR:       RACT: VOC
              *****     BASELINE EMISSIONS INFORMATION     *****
            PSD INCREMENT CONSUMING/EXPANDING: _ (C,E,N)
SO2: SHORT TERM: _____ . ____ (LB/HR)    ANNUAL: _____ . ____ (TON/YR)
 PM: SHORT TERM: _____ . ____ (LB/HR)    ANNUAL: _____ . ____ (TON/YR)
NO2: SHORT TERM: _____ . ____ (LB/HR)    ANNUAL: _____ . ____ (TON/YR)

ISSUE DATE: __ / __ / __        LAST PSD PERMIT: DATE: ../../..  NUMBER: ...
  COMMENTS: ____________________________________________________________
            ____________________________________________________________
            ____________________________________________________________
            ____________________________________________________________
            ____________________________________________________________
            ____________________________________________________________
            ____________________________________________________________
MORE PSD ON FILE? ...                       ACTION TAKEN: U   TRANSMIT HERE: _
```

SINCE 1934

fp Spiralkote, Inc.

A Subsidiary Of Fleming Packaging Corporation

June 11, 1991

Office Of General Counsel
Federal Department of Environmental Regulation
2600 Blairstone Road
Tallahassee FL 32399-2400

Sirs:

Enclosed is a copy of our notice of "intent to issue" for permit file AC-48-192219.

Olympia 746 C-I printing press at Spiralkote, Inc.
1200 Central Florida Parkway
Orlando FL 32819

This notice was published June 6, 1991 in the Orlando Sentinel.

Sincerely,

SPIRALKOTE, INC.

E J Ward Jr

ED WARD, JR.
VICE PRESIDENT PRODUCTION

jac

cc: Barry Andrews - Bureau of Air Regulation

encl. B. Mitchell
C. Collins, C Dist.

1200 CENTRAL FLORIDA PARKWAY ORLANDO, FLORIDA 32821-9295 TEL 407 859-7780 FAX 407 857-0430

The Orlando Sentinel

Published Daily
Orlando, Orange County, Florida

ADVERTISING CHARGE $176.96

State of Florida } ss.
COUNTY OF ORANGE

Before the undersigned authority personally appeared

Noemi R. Lucero, who on oath says that she is the Legal Advertising Representative of the Orlando Sentinel, a Daily newspaper published at Orlando, in Orange County, Florida; that the attached copy of advertisement, being a intent to issue permit in the matter of SPIRALKOTE, INC.

in the Court, was published in said newspaper in the issues of

June 6, 1991

Affiant further says that the said Orlando Sentinel is a newspaper published at Orlando, in said Orange County, Florida, and that the said newspaper has heretofore been continuously published in said Orange County, Florida, each Week Day and has been entered as second-class mail matter at the post office in Orlando, in said Orange County, Florida for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he/she has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Noemi R. Lucero

Sworn to and subscribed before me this 7th day of June A.D., 19 91

Juanita Rosado
Notary Public

JUANITA ROSADO NOTARY PUBLIC STATE OF FLORIDA Seal

Notary Public
State of Florida at Large
My Commission Expires:
June 18, 1994

FORM NO. AD-262

State of Florida
Department of Environmental Regulation
Notice of Intent to Issue

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit to Spiralkote, Inc., 1200 Central Florida Parkway, Orlando, Florida 32809, to modify the Olympia Model 746CI, which is a flexographic printing and coating unit, to allow an increase in the permitted hours of operation and hourly VOC emissions limit. The unit has an associated collection and transport system and a catalytic incinerator system to treat emissions of volatile organic compounds and organic solvents. A determination of Best Available Control Technology (BACT) was not required. The Department is issuing this intent to issue for the reasons stated in the Revised Technical Evaluation and Preliminary Determination.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the postition taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application is available for public inspection during business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:
Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
Department of Environmental Regulation
Cental District
3319 Maguire Blvd., Suite 232
Orlando, Florida 32803-3767

Any person may send written comments on the proposed action to Mr. Barry Andrews at the Department's Tallahassee address. All comments mailed within 14 days of the publication of this notice will be considered in the Department's final determination.

CL-538 Jun.6,1991

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.

Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)*
2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
mr. Ed Ward
Spiral Kote, Inc.
1200 Central 91 Pkwy
Orlando, 91 32809

4. Article Number
P 407 852 703

Type of Service:
- ☐ Registered
- ☐ Insured
- ☑ Certified
- ☐ COD
- ☐ Express Mail
- ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
X

6. Signature — Agent
X

7. Date of Delivery
5-28-91

8. Addressee's Address *(ONLY if requested and fee paid)*

PS Form **3811**, Apr. 1989 ★U.S.G.P.O. 1989-238-815 **DOMESTIC RETURN RECEIPT**

P 407 852 703

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

Sent to
Ed Ward

Street and No.
Spiralkote, Inc.

P.O., State and ZIP Code
Orlando, 91

Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date	AC 48-192219 5-22-91

PS Form 3800, June 1985 ☆U.S.G.P.O. 1989-234-555

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

May 21, 1991

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Ed Ward, Jr., Executive V.P. - Production
Spiralkote, Inc.
1200 Central Florida Parkway
Orlando, Florida 32809

Dear Mr. Ward:

Attached is one copy of the Revised Technical Evaluation and Preliminary Determination (TE&PD) and proposed permit for Spiralkote, Inc. to modify the Olympia Model 746CI, which is a flexographic printing and coating unit, to allow an increase in the permitted hours of operation and the hourly VOC emissions limit. The unit has an associated collection and transport system and a catalytic incinerator system to treat emissions of volatile organic compounds and organic solvents. The revision is based on comments received from you on April 26, 1991, regarding the proposed TE&PD issued on April 4, 1991.

Please submit any written comments you wish to have considered concerning the Department's proposed action to Mr. Barry Andrews of the Bureau of Air Regulation.

Sincerely,

Barry D. Andrews

for C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/BM/plm

Attachments

c: C. Collins, Central District
J. Guidry, P.E., PBS&I, Inc.

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of
Application for Permit by:

Spiralkote, Inc.
1200 Central Florida Parkway
Orlando, Florida 32809

DER File No. AC 48-192219

INTENT TO ISSUE

The Department of Environmental Regulation hereby gives notice of its intent to issue an air construction permit (copy attached) for the proposed project as detailed in the application specified above. The Department is issuing this Intent to Issue for the reasons stated in the attached Revised Technical Evaluation and Preliminary Determination.

The applicant, Spiralkote, Inc., applied on January 29, 1991, to the Department of Environmental Regulation for a permit to modify the Olympia Model 746CI, which is a flexographic printing and coating unit, to allow an increase in the permitted hours of operation and hourly emissions limit. The unit has an associated collection and transport system and a catalytic incinerator system to treat emissions of volatile organic compounds and organic solvents. The proposed project will occur at the applicant's facility located in Orlando, Orange County, Florida.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-2 and 17-4. The project is not exempt from permitting procedures. The Department has determined that an amendment to the air construction permits are required for the proposed work.

Pursuant to Section 403.815, F.S. and DER Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days, in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. The applicant shall provide proof of publication to the Department, at the address specified within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

The Department will issue the permit with the attached conditions unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
(d) A statement of the material facts disputed by Petitioner, if any;
(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application(s) have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in

the Office in General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

for Barry D. Andrews
C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

Copies furnished to:

C. Collins, Central District
J. Guidry, P.E., PBS&I, Inc.

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF INTENT TO ISSUE and all copies were mailed before the close of business on 5-22-91.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to §120.52(9), Florida Statuts, with the designated Department Clerk, receipt of which is hereby acknowledged.

Lynn Tober 5-22-91
Clerk Date

State of Florida
Department of Environmental Regulation
Notice of Intent to Issue

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit to Spiralkote, Inc., 1200 Central Florida Parkway, Orlando, Florida 32809, to modify the Olympia Model 746CI, which is a flexographic printing and coating unit, to allow an increase in the permitted hours of operation and hourly VOC emissions limit. The unit has an associated collection and transport system and a catalytic incinerator system to treat emissions of volatile organic compounds and organic solvents. A determination of Best Available Control Technology (BACT) was not required. The Department is issuing this Intent to Issue for the reasons stated in the Revised Technical Evaluation and Preliminary Determination.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
(d) A statement of the material facts disputed by Petitioner, if any;
(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

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The application is available for public inspection during business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Department of Environmental Regulation
Central District
3319 Maguire Blvd., Suite 232
Orlando, Florida 32803-3767

Any person may send written comments on the proposed action to Mr. Barry Andrews at the Department's Tallahassee address. All comments mailed within 14 days of the publication of this notice will be considered in the Department's final determination.

Revised
Technical Evaluation
and
Preliminary Determination

Spiralkote, Inc.
Orange County
Orlando, Florida

Construction Permit No.
AC 48-192219

Department of Environmental Regulation
Division of Air Resources Management
Bureau of Air Regulation

May 21, 1991

I. Application

A. Applicant

Spiralkote, Inc.
1200 Central Florida Parkway
Orlando, Florida 32821-9295

B. Project and Location

The applicant submitted a request for a modification to allow an increase in the permitted hours of operation and hourly VOC emissions limit and to redefine the raw material input rate. The source, an Olympia Model 746 Central Impressions printing and coating unit (OM746CI), emits volatile organic compounds (VOC). It has an associated dryer system, VOC emissions capture and transport system, and catalytic incinerator system.

The source is part of a facility located at the above address in Orange County. The UTM coordinates are Zone 17, 461.37 km East and 3,142.05 km North.

C. Process and Controls

The OM746CI is used to produce various printed materials. The maximum input rate to the press is 180 pounds of VOC per "run hour" calculated on a daily basis. The associated dryer system consists of three pairs of dryers and they utilize natural gas.

The VOC emissions capture and transport system is subject to a minimum capture efficiency of 70% and the catalytic incinerator system is subject to a minimum destruction efficiency of 95%. The catalytic incinerator system consists of three units and utilizes natural gas.

D. The Standard Industrial Codes are:

Major Group 27 - Printing/Publishing; Group No. 275 - Commercial Printing; Industrial No. 2751 - Commercial Printing, Letterpress and Screen.

II. Rule Applicability

The proposed project is subject to preconstruction review pursuant to Chapter 403, Florida Statutes, and Florida Administrative Code (F.A.C.) Chapters 17-2 and 17-4, and 40 CFR (July, 1990 version).

The application package was deemed complete on January 29, 1991.

The facility is located in Orange County, which is designated as a maintenance area for the pollutant ozone pursuant to F.A.C. Rule 17-2.460(1)(b). The facility is a major facility for the pollutant VOC pursuant to F.A.C. Rule 17-2.100. VOCs are considered precursors to ozone.

Other pollutants emitted from the facility are nitrogen oxides (NOx), sulfur dioxide, carbon monoxide, particulate matter, and hydrocarbons as a result of the combustion of natural gas. With the exeption of NOx, the total facility projected potential emission for each pollutant is less than 0.5 TPY and considered insignificant. The total facility NOx emissions are estimated to be 1.5 TPY and also considered insignificant.

The projected potential VOC emissions are 71.3 TPY, based on a monthly rolling cumulative total of VOC emissions including clean-up solvent less solvent waste shipped as hazardous waste. The maximum input rate of pounds of VOC to the press is 180 lbs/"run hour" and will be calculated on a daily basis. The projected potential hourly VOC emissions rate will increase from the permitted 22.8 lbs/hr to 60 lbs/"run hour."

An increase in the actual VOC emissions and the relaxation in the permitted hours of operation and hourly VOC emissions limit constitute a modification. Since the annual potential/allowable VOC emissions will not change, the request will be a minor modification and subject to review pursuant to F.A.C. Rule 17-2.520, Sources Not Subject to Prevention of Significant Deterioration or Nonattainment Requirements.

The OM746CI printing and coating unit and associated control systems are subject to all applicable standards of F.A.C. Chapters 17-2 and 17-4 and 40 CFR (July, 1990 version).

The source is subject to the applicable provisions of F.A.C. Rules 17-2.240: Circumvention; 17-2.250: Excess Emissions; 17-2.600(1)(a): Incinerators; 17-2.620: General Pollutant Emission Limiting Standards; 17-2.700: Stationary Point Source Emission Test Procedures; and, 17-4.130: Plant Operation-Problems. The minimum capture and transport efficiency was established pursuant to F.A.C. Rule 17-2.620(1)(a) and the applicant's request and the destruction efficiency was established pursuant to F.A.C. Rules 17-2.620(1)(a) and 17-2.650(1)(f)16.b.(i)(c) and the applicant's request.

A performance test shall be conducted on the capture and transport system to determine the capture efficiency and in accordance with the U.S. EPA's "Guidelines for Developing a State Protocol for the Measurement of Capture Efficiency." The applicant will be required to select the protocol that will be used at least 60 days prior to compliance testing and the Department's Central District will be notified in writing.

EPA Method 25, in accordance with F.A.C. Rule 17-2.700 and 40 CFR 60, Appendix A, will be used to demonstrate the actual destruction efficiency (comparison of inlet and outlet concentrations). EPA Method 24A will be used to determine the VOC content of the ink in accordance with F.A.C. Rule 17-2.700 and 40 CFR 60, Appendix A.

Pursuant to F.A.C. Rule 17-2.600(1)(a)1., the visible emissions (VE) standards is "no visible emissions" (5% opacity), except that visible emissions not exceeding 20% opacity are allowed for up to 3 minutes in any one hour. VE compliance testing shall be conducted using DER Method 9 in accordance with F.A.C. Rule 17-2.700 and Table 700-1.

Objectionable odors are not allowed off of the property in accordance with F.A.C. Rules 17-2.620(2) and 17-2.600(1)(a)2.

III. Summary of Emissions and Air Quality Analysis

A. Emission Limitations

The regulated pollutant emissions from the source are VOCs. The source is also subject to a visible emissions (VE) standard. The following table will reflect the allowable emission standards and limitations:

Table

Source	Pollutant	Maximum Allowable Emissions
OM746CI	VOC	60 lbs/"run hour", including clean-up solvent less solvent shipped out as hazardous waste: 71.3 TPY
	VE	No VE (5% opacity), except that VE ≤ 20% opacity are allowed for up to 3 minutes in any one hour

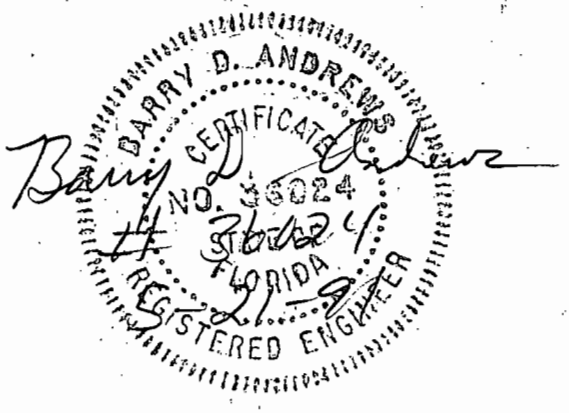
Note:
- o Continuous operation is allowed (i.e., 8760 hrs/yr).
- o The maximum input to the press is 180 lbs VOC/"run hour" calculated on a daily basis.
- o Minimum capture and transport efficiency is 70%.
- o Minimum destruction efficiency is 95%.
- o The annual VOC emissions will be based on a monthly rolling cumulative total, including clean-up solvent less solvent waste shipped as hazardous waste.

B. Air Quality Analysis

Based on a technical review of the project, an air quality analysis was not required.

IV. Conclusion

Based on the information provided by Spiralkote, Inc., the Department has reasonable assurance that the proposed modification to allow an increase in the permitted hours of operation and hourly VOC emissions limit, as described in this revised evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-2 of the Florida Administrative Code.



Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

PERMITTEE:
Spiralkote, Inc.
1200 Central Florida Parkway
Orlando, Florida 32809

Permit Number: AC 48-192219
Expiration Date: March 31, 1992
County: Orange
Latitude/Longitude: 28°24'21"N
81°23'40"W
Project: Olympia 746 Flexographic Printing & Coating Unit & Associated Catalytic Incinerator Modification

This permit is issued under the provisions of Chapter 403, Florida Statutes, Florida Administrative Code (F.A.C.) Chapters 17-2 and 17-4, and 40 CFR (July, 1990 version). The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the modification of the Olympia Model 746 Central Impressions, which is a flexographic printing and coating unit with associated natural gas dryers: a pair of 0.8×10^6 Btu/hr overhead dryer, a pair of 0.8×10^6 Btu/hr overhead dryer, and a pair of 0.4×10^6 Btu/hr tunnel dryers. The dryers will operate at an idling level when not being used for production. The associated catalytic incinerator system will have a minimum 70% capture and transport efficiency and 95% destruction efficiency. The incinerator system was custom designed by Etter Engineering Company, Inc., and consists of three incinerators (No. 1: 2252 dscfm; No. 2: 3065 dscfm; and, No. 3: 2658 dscfm) and are natural gas fired (0.8×10^6 Btu/hr, maximum; 0.1×10^6 Btu/hr, normal) using Eclipse Model 80-AHO burners. The duct work and collection system was designed and installed by Dec-E-Tech Industrial Design Engineering. The source emits volatile organic compounds and organic solvents (used for clean-up). The UTM coordinates are Zone 17, 461.37 km East and 3142.02 km North.

The Standard Industrial Codes are: Major Group 27 - Printing/Publishing; Group No. 275 - Commercial Printing; Industrial Number 2751 - Commercial Printing, Letterpress and Screen.

The sources shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Application to Construct Air Pollution Sources, DER Form 17-1.202(1), received January 29, 1991.

Attachments cont.:

2. Mr. Bruce P. Miller's letter with enclosure ("Guidelines for Developing a State Protocol for the Measurement of Capture Efficiency") dated May 15, 1990.
3. Technical Evaluation and Preliminary Determination dated April 4, 1991.
4. Mr. E. J. Ward Jr.'s letter received April 26, 1991.
5. Revised Technical Evaluation and Preliminary Determination dated May 21, 1991.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee

GENERAL CONDITIONS:

to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

a. Have access to and copy any records that must be kept under the conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

GENERAL CONDITIONS:

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

GENERAL CONDITIONS:

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

14. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SPECIFIC CONDITIONS:

1. The source may operate continuously (i.e., 8760 hrs/yr).

2. Total maximum allowable VOC (volatile organic compounds-organic solvents) emission limit shall not exceed 60.0 pounds per "run hour" and 71.3 tons per year, including clean-up solvent less any solvent waste shipped from the source [based on a minimum 70% capture and transport efficiency and a minimum 95% destruction efficiency (oxidizes at least 95% of the VOC measured as total combustible carbon to carbon dioxide and water)]. The 12 month rolling cumulative total VOC emissions from the press shall not exceed 71.3 TPY calculated on a monthly basis. The VOC emissions will be calculated based on actual daily input and annual test results for capture and destruction. EPA Method 24A shall be utilized to determine the VOC content of the ink pursuant to F.A.C. Rule 17-2.700 and 40 CFR 60, Appendix A (July, 1990 version).

3. The maximum input to the press is 180 pounds of VOC per "run hour" calculated on a daily basis. The permitted materials are all inks, solvents and coatings similar to those stated in the application.

4. The initial and annual demonstration of the capture efficiency shall be conducted using the U.S. EPA's "Guidelines for Developing a State Protocol for the Measurement of Capture Efficiency" (attached). The permittee shall notify the Department's Central District in writing of the protocol that will be used for the capture efficiency demonstration purpose at least 60 days prior to compliance testing.

SPECIFIC CONDITIONS:

5. Initial and annual compliance tests for the actual destruction efficiency (comparison of the inlet and outlet concentrations) of the catalytic incinerator shall be conducted using EPA Method 25, pursuant to F.A.C. Rule 17-2.700 and 40 CFR 60, Appendix A (July, 1990 version). Other test methods may be used as long as prior Department approval has been granted in writing in accordance with F.A.C. Rule 17-2.700(3).

6. A material balance scheme shall be used to assess and report the annual (verifiable monthly) VOC/solvent emissions associated with clean-up. The material balance scheme will account for the VOC/solvents received, any control measures used (must be quantifiable), and any VOC/solvents shipped off the facility by a properly licensed hauler.

7. The Department's Central District office shall be notified in writing at least 15 days prior to conducting compliance tests pursuant to F.A.C. Rule 17-2.700(2).

8. Test reports shall be submitted to the Department's Central District office no later than 45 days after the last sampling run of each test is completed pursuant to F.A.C. Rule 17-2.700(7).

9. This project is subject to all applicable provisions of F.A.C. Chapters 17-2 and 17-4 and 40 CFR (July, 1990 version).

10. The sources are subject to the applicable provisions of F.A.C. Rules 17-2.240: Circumvention; 17-2.250: Excess Emissions; and, 17-4.130: Plant Operation-Problems.

11. Objectionable odors shall not be allowed off plant property pursuant to F.A.C. Rules 17-2.620(2) and 17-2.600(1)(a)2.

12. Pursuant to F.A.C. Rule 17-2.600(1)(a)1., the catalytic incinerator is subject to the visible emissions standard of "no visible emissions" (5% opacity) except that visible emissions not exceeding 20% opacity are allowed for up to three minutes in any one hour period. Initial and annual compliance tests shall be conducted using DER Method 9 pursuant to Table 700-1, F.A.C. Rule 17-2.700.

13. An annual operating report shall be submitted to the Department's Central District office by March 1 of each calendar year accounting for the annual VOC/solvent emissions, which shall minimally include source test results, quantifiable fugitives and clean-up VOCs/solvents.

SPECIFIC CONDITIONS:

14. Any change in the method of operation pursuant to F.A.C. Rule 17-2.100, Definitions-Modification, the permittee shall submit an application and the appropriate processing fee to the Bureau of Air Regulation office.

15. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Department's Bureau of Air Regulation office prior to 60 days before the expiration date of the permit (F.A.C. Rule 17-4.090).

16. An application for an operation permit must be submitted to the Department's Central District office at least 90 days prior to the expiration date of this construction permit. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed while noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rules 17-4.055 and 17-4.220).

Issued this _____ day
of _____, 1991

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

_____

STEVE SMALLWOOD, P.E., Director
Division of Air Resources
Management

I N T E R O F F I C E M E M O R A N D U M

Date: 16-May-1991 01:16pm GMT
From: Iris Littleton
LITTLETON_I
Dept: Office General Counsel
Tel No: 904/488-9730

TO: Alex Alexander (ALEXANDER,ALEX)

CC: Pat Manning (MANNING_P)

Subject: New OGC Case Assignment

TO: Alex Alexander

FROM: Iris - OGC - Tallahassee

Received 5/14/91 request for an Extension of Time from fp Spiralkote, Inc. concerning permit AC48-157290.

cc: B. Mitchell

SINCE 1934

fp Spiralkote, Inc.

A Subsidiary Of Fleming Packaging Corporation

April 19, 1991

Mr. Barry Andrews
Florida DER
2600 Blair Stone Road
Tallahassee FL 32399-2400

RE: Spiralkote's Olympia Model 746 C-I press
DER File No. AC-192219

Dear Barry:

We received your Technical Evaluation and Preliminary Determination with proposed permit on April 8, 1991. After reviewing it with Jerome Guidry (our consultant P.E.) we have identified several points which need to be addressed prior to publication.

We intend to submit written comments by April 26, 1991.

Sincerely,

E J Ward

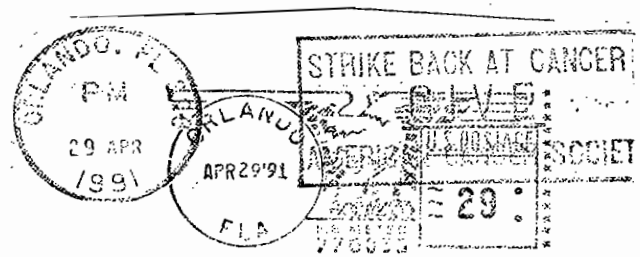
ED WARD, JR.
Vice President Production
fp Spiralkote, Inc.
1200 Central Florida Parkway
Orlando FL 32821

Phone (407) 859-7789
Fax (407) 857-0430

SINCE 1934

fp Spiralkote, Inc.

1200 CENTRAL FLORIDA PARKWAY ORLANDO, FLORIDA 32821-9295



ATTN: BARRY ANDREWS
FLORIDA DER
2600 BLAIR STONE ROAD
TALLAHASSEE FL 32399-2400

Barry Andrews
Florida DER
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

4-24-91

re: Spiralkote's Olympia Model 746 CI press
Der file No. AC-192219

Dear Barry,

The following corrections and changes are requested before issuing the permit.

Technical evaluation and preliminary determination

1. Application part C. Process and controls
Change "composite can labels"
To: "various printed materials".

We print bags, gift wrap, stickers, foil lids, convolute roll labels, and foam. In order to remain a viable company, a business must print a full range of materials.

2. II. Rule Applicability paragraph 5
Change: "potential VOC emissions are 70.3 TPY"
To: "potential VOC emissions are 71.3 TPY"

This appears to be a typographical error since all other references to tons per year are 71.3 typ.

3. III. Summary of emissions and air quality analysis
Table under A. Emission limitations
Change: 60 lbs/"run hour"/day
To: 60 lbs/"run hour"

4. Actual permit page 1 of 7 Paragraph 2

Change: "0.8 x10 6th btu/hr overhead dryer, a 0.5 x 10 6th btu/hr overhead dryer,and a 0.5 x 10 6th btu/hr tunnel oven"
To: "a pair of 0.8 x 10 6th btu/hr overhead dryers, a pair of 0.8 x 10 6th btu/hr overhead dryers, and a pair of 0.4 x 10 6th btu/hr tunnel dryers."

This change documents the original installation at maximum nameplate burner capacity rather than average planned usage.

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL
PACKAGE TRACKING NUMBER 2855135102

2855135102

RECIPIENT'S COPY

Date 4/25/91

From (Your Name) Please Print — Your Phone Number (Very Important)
1 MR. ED WARD — 407 859-7780

Company: FP SPIRALKOTE, INC. — Department/Floor No:

Street Address: 1200 CENTRAL FLORIDA PKWY.

City: ORLANDO, FL — State: — ZIP Required: 32821

To (Recipient's Name) Please Print — Recipient's Phone Number (Very Important)
2 MR. BARRY ANDREWS — ( )

Company: FLORDAA D.E.R. — Department/Floor No:

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip + Codes.): 2600 BLAIR STONE ROAD

City: TALLAHASSEE, FL — State: — ZIP Required: 32399-24

YOUR INTERNAL BILLING REFERENCE INFORMATION (First 24 characters will appear on invoice.)

H IF HOLO FOR PICK-UP, Print FEDEX Address Here
Street Address:
City: — State: — ZIP Required:

3 PAYMENT 1 ☒ Bill Sender 2 ☐ Bill Recipient's FedEx Acct. No. 3 ☐ Bill 3rd Party FedEx Acct. No. 4 ☐ Bill Credit Card
5 ☐ Cash/Check

4 SERVICES (Check only one box)

Priority Overnight Service (Delivery by next business morning†)	Standard Overnight Service (Delivery by next business afternoon†)
11 ☐ YOUR PACKAGING	51 ☐
16 ☐ FEDEX LETTER*	56 ☐ FEDEX LETTER*
12 ☐ FEDEX PAK*	52 ☐ FEDEX PAK*
13 ☐ FEDEX BOX	53 ☐ FEDEX BOX
14 ☐ FEDEX TUBE	54 ☐ FEDEX TUBE
Economy Two-Day Service (formerly Standard Air) (Delivery by second business day†)	**Heavyweight Service** (for Extra Large or any package over 150 lbs.)
30 ☐ ECONOMY TWO-DAY SVC.	70 ☐ HEAVYWEIGHT**
	80 ☐ DEFERRED HEAVYWEIGHT**

† Delivery commitment may be later in some areas. *Declared Value Limit $100. **Call for delivery schedule.

5 DELIVERY AND SPECIAL HANDLING (Check services required)

1 ☐ HOLO FOR PICK-UP (Fill in Box H)
2 ☒ DELIVER WEEKDAY
3 ☐ DELIVER SATURDAY (Extra charge) (Not available to all locations)
4 ☐ DANGEROUS GOODS (Extra charge)
5 ☐
6 ☐ DRY ICE ____ Lbs.
7 ☐ OTHER SPECIAL SERVICE
8 ☐
9 ☐ SATURDAY PICK-UP (Extra charge)
10 ☐
11 ☐
12 ☐ HOLIDAY DELIVERY (If offered) (Extra charge)

PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE
1	1	
Total	Total	Total

DIM SHIPMENT (Chargeable Weight) ☐ ____ lbs.

Received At: 1 ☐ Regular Stop 2 ☐ On-Call Stop 3 ☐ Drop Box 4 ☐ B.S.C. 5 ☐ Station

FedEx Emp. No. — Date/Time

5 Release Signature:

Emp. No. — Date
☐ Cash Received
☐ Return Shipment
☐ Third Party ☒ Chg. To Del ☐ Chg. To Hold
Street Address
City — State — Zip
Received By: X
Date/Time Received — FedEx Employee Number

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 8/90
PART #119500 GBFE
FORMAT #0411

041

5. Actual permit page 5 of 7 Specific condition 2.
Delete "and includes 1 TPY of cleanup solvent."
The inclusion of the cleanup solvent is mentioned earlier in the same sentence.

6. Actual permit page 5 of 7 Specific condition 3.
Change: "The permitted materials are as stated in the application."

To: " The permitted materials are all inks, solvents and coatings similar to those stated in the application."

Each label, bag and printed piece needs custom inks and coatings to meet the demands of the marketplace. Therefore our specific inks and coatings change frequently. However the solvent contents are quite similar ranging from 50 to 75%.

Also a business needs the ability to develop duplicate price-competitive suppliers with out the need to change our permit on a monthly basis.

7. Actual permit Page 6 of 7 Specific condition 4. % capture
a. Change the requirement from annual testing to testing once every five years because the testing is very costly from lost production, lost raw materials and from testing fees.

b. Additionally, modify the referenced capture efficiency test methods from three 8 hour tests to 3 tests runs of 1 hour duration after the system has reached a steady state. This usually takes 20 minutes. The enclosed Table I document trials that show the fugitive, captured and stack emissions ppm of VOC, measured by fid, are stable after 20 minutes of run time.

We ask for this modification because: 1. We are unable to sustain 8 hours of continuous run at maximum capacity. Due to the nature of our business only 9 hours of every 24 is a "run hour" even thou our presses are manned 24 hours a day. This is documented in our application. It should be noted that even this 9 hours of run time occurs in 45 minute to 90 intervals which is the run time of a roll of paper. Please consult with Dennis Nester or Dale Maclarty of Orange County(407-836-7400). They are the official observers of most of our previous compliance tests. I think they will verify the extreme difficulty of conducting accurate continuous 8 hour tests.

Annually, thereafter test the inlet of the incinerators using epa Method 25a and compare the values with the initial test. Capture efficiency will be demonstrated if the concentration of the inlet is comparable with the initial test.

8. Actual permit page 6 of 7 Specific condition 5 (Percent Destruction)

Because of the inaccuracies of Method 25 at low concentrations (below 50 PPM) and because we have already determined the quantity of carbon availible for destruction by method 25A in specific condition 4, we propose the following:

> 5. Initial compliance tests for the actual destruction efficiency(comparison of inlet and outlet concentrations) of the catalytic incinerator shall be conducted as follows:
>
> Conduct the capture efficiency test using the U.S.E.P.A.'s "Guidelines for developing a State Protocol for the Measurement of Capture efficiency". This data will provide the inlet VOC concentration used for also determining destruction efficiency. Measure the outlet concentration of the incinerators using EPA method 25. Compare EPA Method 25A data on the inlet with the EPA METHOD 25 data on the outlet to determine destruction efficiency. If the outlet VOC concentrations are equal to or less than 50 ppm as measured on the FID, use EPA Method 25 A as the test method for demonstrating destruction efficiency.
>
> Destruction efficiency will be calculated annually.

E J Ward

E. J. Ward Jr.
VP production
FP Spiralkote
1200 Central Florida Parkway
Orlando, Florida 32821

Phone 407-859-7780
fax 407-857-0430

cc: B. Mitchell
C. Collins

Barry Andrews
Florida DER
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

4-19-91

re: Spiralkote's Olympia Model 746 CI press
Der file No. AC-192219

Dear Barry,

We recieved your Technical Evaluation and Preliminary Determination with proposed permit on 4-8-91. After reviewing it with Jerome Guidry(our consultant P.E) we have identified several points which need to be addressed prior to publication.

We intend to submit written comments by April 26th, 1991.

E. J. Ward Jr.
VP production
FP Spiralkote
1200 Central Florida Parkway
Orlando, Florida 32821

Phone 407-859-7780
fax 407-857-0430

Kidder Ci coater deck incinerator

TABLE I

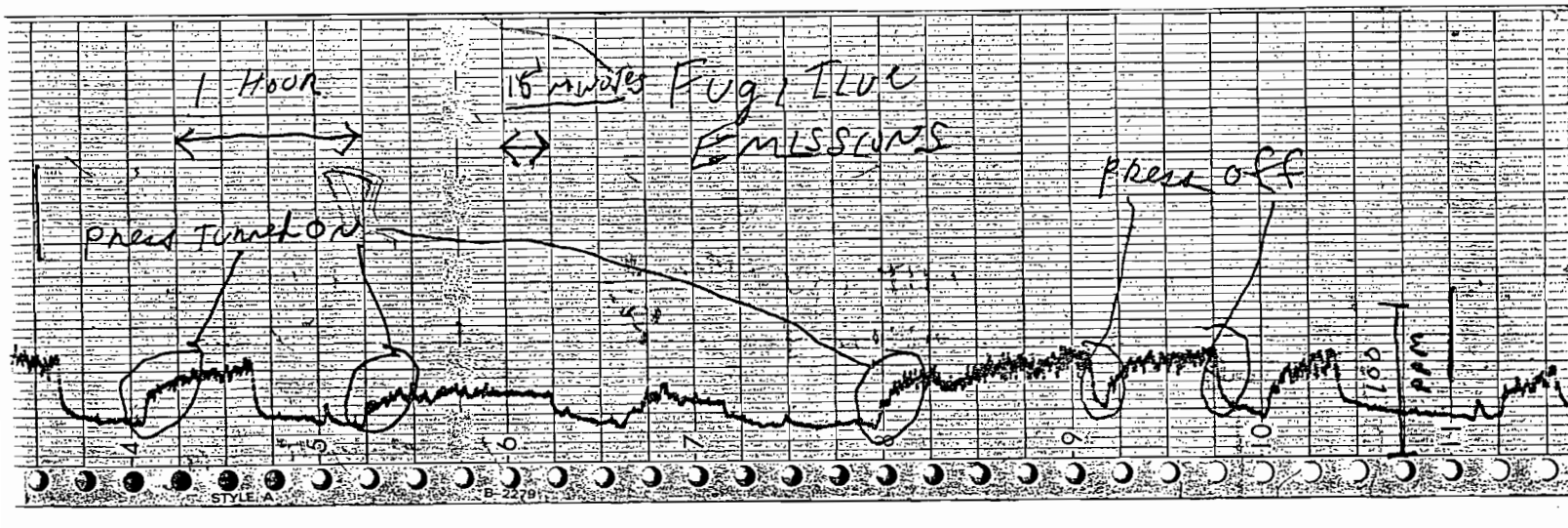
8:25 am to 9:47 AM
3-27-91
Job 23111
morning delight ten count bisquit texas buttermilk

minute	inlet ppm	outlet ppm	
1	1500	110	92.7%
2	1500	118	92.1%
3	1600	117	92.7%
4	1700	117	93.1%
5	1800	117	93.5%
6	1800	117	93.5%
7	1900	117	93.8%
8	1900	115	93.9%
9	1900	114	94.0%
10	1900	112	94.1%
11	1900	102	94.6%
12	1900	90	95.3%
13	2000	85	95.8%
14	2000	80	96.0%
15	2000	70	96.5%
16	2000	48	97.6%
17	2100	48	97.7%
18	2100	48	97.7%
19	2100	48	97.7%
20	2100	48	97.7%
21	2100	48	97.7%
22	2200	48	97.8%
23	2000	48	97.6%
24	2000	48	97.6%
25	2000	48	97.6%
26	2000	45	97.8%
27	2000	45	97.8%
28	2000	45	97.8%
29	2000	45	97.8%
30	2100	40	98.1%
31	2000	40	98.0%
32	2000	40	98.0%
33	2300	40	98.3%
34	2100	35	98.3%
35	2000	35	98.3%
36	2000	35	98.3%
37	2100	35	98.3%
38	1900	35	98.2%
39	1900	35	98.2%
40	2000	32	98.4%
41	2000	32	98.4%
42	2000	32	98.4%
43	2000	32	98.4%
44	2100	32	98.5%
45	2000	32	98.4%
46	1900	32	98.3%

47	2000	32	98.4%			
48	2100	32	98.5%			
49	1900	35	98.2%			
50	2000	35	98.3%			
51	2100	35	98.3%			
52	2100	35	98.3%			
53	2100	35	98.3%			
54	2100	35	98.3%			
55	2100	35	98.3%			
56	2000	35	98.3%			
57	2000	35	98.3%			
58	2000	32	98.4%			
59	1900	32	98.3%			
60	1900	32	98.3%	1978	55	97.1%
61	2000	55	97.3%			
62	2100	32	98.5%			
63	2200	32	98.5%			
64	2100	32	98.5%			
65	2100	35	98.3%			
66	2200	35	98.4%			
67	2000	35	98.3%			
68	2000	35	98.3%			
69	2000	35	98.3%			
70	2000	35	98.3%			
71	2000	35	98.3%			
72	2100	35	98.3%			
73	2100	35	98.3%			
74	2100	35	98.3%			
75	2000	35	98.3%			
76	2000	35	98.3%			
77	2000	32	98.4%			
78	1900	32	98.3%			
79	1900	32	98.3%			
80	2000	32	98.4%			
81	2000	35	98.3%			
82	1900	35	98.2%	1993	50	97.4%

end of roll

	average 60 min	average 82 min
inlet ppm leveled off at 13 minutes at 1900 to 2100	1978	1993
outlet leveled off at 34 minutes at 32-35	55	50
% destruction leveled off at 33 minutes at 98.3%	97.1 %	97.4 %



SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.

Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. ☒ Show to whom delivered, date, and addressee's address. *(Extra charge)* 2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
Mr. Ed Ward, Jr.
V.P.-Production
Spiralkote, Inc.
1200 Central Florida Parkway
Orlando, FL 32809

4. Article Number
P 407 802 154

Type of Service:
☐ Registered ☒ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
X [signature]

6. Signature — Agent
X

7. Date of Delivery
4-8-91

8. Addressee's Address *(ONLY if requested and fee paid)*
1200 CENT. FL. Pkwy
ORL FL.
32809

PS Form 3811, Apr. 1989 ★U.S.G.P.O. 1989-238-815 DOMESTIC RETURN RECEIPT

P 407 802 154

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

Sent to
Mr. Ed Ward, Jr.
V.P. Production
Spiralkote, Inc.
Street and No.
1200 Central Florida Parkway
P.O. State and ZIP Code
Orlando, FL 32809

Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date mailed: 4/4/91 AC 48-192219	

PS Form 3800, June 1985 ☆U.S.G.P.O. 1989-234-555

File Copy

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

April 4, 1991

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Ed Ward, Jr., Executive V.P. - Production
Spiralkote, Inc.
1200 Central Florida Parkway
Orlando, Florida 32809

Dear Mr. Ward:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit for Spiralkote, Inc. to modify the Olympia Model 746CI, which is a flexographic printing and coating unit, to allow an increase in the permitted hours of operation and hourly VOC emissions limit. The unit has an associated collection and transport system and a catalytic incinerator system to treat emissions of volatile organic compounds and organic solvents.

Please submit any written comments you wish to have considered concerning the Department's proposed action to Mr. Barry Andrews of the Bureau of Air Regulation.

Sincerely,

Barry D. Andrews

for C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/BM/plm

Attachments

c: C. Collins, Central District
J. Guidry, P.E., PBS&I, Inc.
Acadia
Bruce Mitchell } 4-4-91 RSR

Note: Attachment # 2 was included in the copies to Ed Ward, Jr. & John Guidry RSR

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of
Application for Permit by:

Spiralkote, Inc.
1200 Central Florida Parkway
Orlando, Florida 32809

DER File No. AC 48-192219

INTENT TO ISSUE

The Department of Environmental Regulation hereby gives notice of its intent to issue an air construction permit (copy attached) for the proposed project as detailed in the application specified above. The Department is issuing this Intent to Issue for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, Spiralkote, Inc., applied on January 29, 1991, to the Department of Environmental Regulation for a permit to modify the Olympia Model 746CI, which is a flexographic printing and coating unit, to allow an increase in the permitted hours of operation and hourly emissions limit. The unit has an associated collection and transport system and a catalytic incinerator system to treat emissions of volatile organic compounds and organic solvents. The proposed project will occur at the applicant's facility located in Orlando, Orange County, Florida.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-2 and 17-4. The project is not exempt from permitting procedures. The Department has determined that an amendment to the air construction permits are required for the proposed work.

Pursuant to Section 403.815, F.S. and DER Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days, in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. The applicant shall provide proof of publication to the Department, at the address specified within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

The Department will issue the permit with the attached conditions unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
(d) A statement of the material facts disputed by Petitioner, if any;
(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application(s) have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in

the Office in General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

for Barry D. Andrews

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

Copies furnished to:

C. Collins, Central District
J. Guidry, P.E., PBS&I, Inc.

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF INTENT TO ISSUE and all copies were mailed before the close of business on 4-4-91.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to §120.52(9), Florida Statuts, with the designated Department Clerk, receipt of which is hereby acknowledged.

Kyra Dobes 4-4-91
Clerk Date

State of Florida
Department of Environmental Regulation
Notice of Intent to Issue

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit to Spiralkote, Inc., 1200 Central Florida Parkway, Orlando, Florida 32809, to modify the Olympia Model 746CI, which is a flexographic printing and coating unit, to allow an increase in the permitted hours of operation and hourly VOC emissions limit. The unit has an associated collection and transport system and a catalytic incinerator system to treat emissions of volatile organic compounds and organic solvents. A determination of Best Available Control Technology (BACT) was not required. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
(d) A statement of the material facts disputed by Petitioner, if any;
(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application is available for public inspection during business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Department of Environmental Regulation
Central District
3319 Maguire Blvd., Suite 232
Orlando, Florida 32803-3767

Any person may send written comments on the proposed action to Mr. Barry Andrews at the Department's Tallahassee address. All comments mailed within 14 days of the publication of this notice will be considered in the Department's final determination.

Technical Evaluation
and
Preliminary Determination

Spiralkote, Inc.
Orange County
Orlando, Florida

Construction Permit No.
AC 48-192219

Department of Environmental Regulation
Division of Air Resources Management
Bureau of Air Regulation

April 4, 1991

I. Application

A. Applicant

Spiralkote, Inc.
1200 Central Florida Parkway
Orlando, Florida 32821-9295

B. Project and Location

The applicant submitted a request for a modification to allow an increase in the permitted hours of operation and hourly VOC emissions limit and to redefine the raw material input rate. The source, an Olympia Model 746 Central Impressions printing and coating unit (OM746CI), emits volatile organic compounds (VOC). It has an associated dryer system, VOC emissions capture and transport system, and catalytic incinerator system.

The source is part of a facility located at the above address in Orange County. The UTM coordinates are Zone 17, 461.37 km East and 3,142.05 km North.

C. Process and Controls

The OM746CI is used to produce composite can labels. The maximum input rate to the press is 180 pounds of VOC per "run hour" calculated on a daily basis. The associated dryer system consists of three dryers and they utilize natural gas.

The VOC emissions capture and transport system is subject to a minimum capture efficiency of 70% and the catalytic incinerator system is subject to a minimum destruction efficiency of 95%. The catalytic incinerator system consists of three units and utilizes natural gas.

D. The Standard Industrial Codes are:

Major Group 27 - Printing/Publishing; Group No. 275 - Commercial Printing; Industrial No. 2751 - Commercial Printing, Letterpress and Screen.

II. Rule Applicability

The proposed project is subject to preconstruction review pursuant to Chapter 403, Florida Statutes, and Florida Administrative Code (F.A.C.) Chapters 17-2 and 17-4, and 40 CFR (July, 1990 version).

The application package was deemed complete on January 29, 1991.

The facility is located in Orange County, which is designated as a maintenance area for the pollutant ozone pursuant to F.A.C. Rule 17-2.460(1)(b). The facility is a major facility for the pollutant VOC pursuant to F.A.C. Rule 17-2.100. VOCs are considered precursors to ozone.

Other pollutants emitted from the facility are nitrogen oxides (NOx), sulfur dioxide, carbon monoxide, particulate matter, and hydrocarbons as a result of the combustion of natural gas. With the exeption of NOx, the total facility projected potential emission for each pollutant is less than 0.5 TPY and considered insignificant. The total facility NOx emissions are estimated to be 1.5 TPY and also considered insignificant.

The projected potential VOC emissions are 70.3 TPY, based on a monthly rolling cumulative total of VOC emissions including clean-up solvent less solvent waste shipped as hazardous waste. The maximum input rate of pounds of VOC to the press is 180 lbs/"run hour" and will be calculated on a daily basis. The projected potential hourly VOC emissions rate will increase from the permitted 22.8 lbs/hr to 60 lbs/"run hour."

An increase in the actual VOC emissions and the relaxation in the permitted hours of operation and hourly VOC emissions limit constitute a modification. Since the annual potential/allowable VOC emissions will not change, the request will be a minor modification and subject to review pursuant to F.A.C. Rule 17-2.520, Sources Not Subject to Prevention of Significant Deterioration or Nonattainment Requirements.

The OM746CI printing and coating unit and associated control systems are subject to all applicable standards of F.A.C. Chapters 17-2 and 17-4 and 40 CFR (July, 1990 version).

The source is subject to the applicable provisions of F.A.C. Rules 17-2.240: Circumvention; 17-2.250: Excess Emissions; 17-2.600(1)(a): Incinerators; 17-2.620: General Pollutant Emission Limiting Standards; 17-2.700: Stationary Point Source Emission Test Procedures; and, 17-4.130: Plant Operation-Problems. The minimum capture and transport efficiency was established pursuant to F.A.C. Rule 17-2.620(1)(a) and the applicant's request and the destruction efficiency was established pursuant to F.A.C. Rules 17-2.620(1)(a) and 17-2.650(1)(f)16.b.(i)(c) and the applicant's request.

A performance test shall be conducted on the capture and transport system to determine the capture efficiency and in accordance with the U.S. EPA's "Guidelines for Developing a State Protocol for the Measurement of Capture Efficiency." The applicant will be required to select the protocol that will be used at least 60 days prior to compliance testing and the Department's Central District will be notified in writing.

EPA Method 25, in accordance with F.A.C. Rule 17-2.700 and 40 CFR 60, Appendix A, will be used to demonstrate the actual destruction efficiency (comparison of inlet and outlet concentrations). EPA Method 24A will be used to determine the VOC content of the ink in accordance with F.A.C. Rule 17-2.700 and 40 CFR 60, Appendix A.

Pursuant to F.A.C. Rule 17-2.600(1)(a)1., the visible emissions (VE) standards is "no visible emissions" (5% opacity), except that visible emissions not exceeding 20% opacity are allowed for up to 3 minutes in any one hour. VE compliance testing shall be conducted using DER Method 9 in accordance with F.A.C. Rule 17-2.700 and Table 700-1.

Objectionable odors are not allowed off of the property in accordance with F.A.C. Rules 17-2.620(2) and 17-2.600(1)(a)2.

III. Summary of Emissions and Air Quality Analysis

A. Emission Limitations

The regulated pollutant emissions from the source are VOCs. The source is also subject to a visible emissions (VE) standard. The following table will reflect the allowable emission standards and limitations:

Table

Source	Pollutant	Maximum Allowable Emissions
OM746CI	VOC	60 lbs/"run hour"/day, including clean-up solvent less solvent shipped out as hazardous waste: 71.3 TPY
	VE	No VE (5% opacity), except that VE $\leq$ 20% opacity are allowed for up to 3 minutes in any one hour

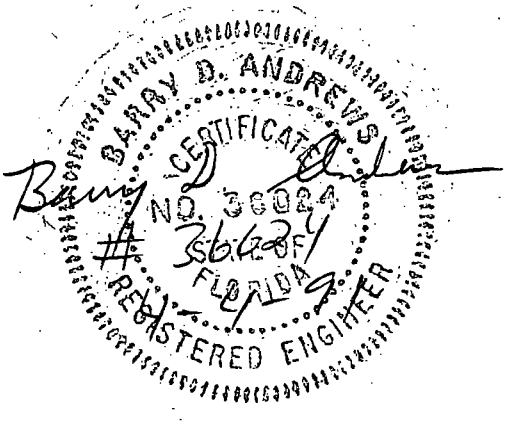
Note:
- o Continuous operation is allowed (i.e., 8760 hrs/yr).
- o The maximum input to the press is 180 lbs VOC/"run hour" calculated on a daily basis.
- o Minimum capture and transport efficiency is 70%.
- o Minimum destruction efficiency is 95%.
- o The annual VOC emissions will be based on a monthly rolling cumulative total, including clean-up solvent less solvent waste shipped as hazardous waste.

B. Air Quality Analysis

Based on a technical review of the project, an air quality analysis was not required.

IV. Conclusion

Based on the information provided by Spiralkote, Inc., the Department has reasonable assurance that the proposed modification to allow an increase in the permitted hours of operation and hourly VOC emissions limit, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-2 of the Florida Administrative Code.



Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

PERMITTEE:
Spiralkote, Inc.
1200 Central Florida Parkway
Orlando, Florida 32809

Permit Number: AC 48-192219
Expiration Date: March 31, 1992
County: Orange
Latitude/Longitude: 28°24'21"N
81°23'40"W
Project: Olympia 746 Flexographic Printing & Coating Unit & Associated Catalytic Incinerator Modification

This permit is issued under the provisions of Chapter 403, Florida Statutes, Florida Administrative Code (F.A.C.) Chapters 17-2 and 17-4, and 40 CFR (July, 1990 version). The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the modification of the Olympia Model 746 Central Impressions, which is a flexographic printing and coating unit with three associated natural gas dryers: a 0.8 x 10^6 Btu/hr overhead dryer, a 0.5 x 10^6 Btu/hr overhead dryer, and a 0.15 x 10^6 Btu/hr tunnel oven. The dryers will operate at an idling level when not being used for production. The associated catalytic incinerator system will have a minimum 70% capture and transport efficiency and 95% destruction efficiency. The incinerator system was custom designed by Etter Engineering Company, Inc., and consists of three incinerators (No. 1: 2252 dscfm; No. 2: 3065 dscfm; and, No. 3: 2658 dscfm) and are natural gas fired (0.8 x 10^6 Btu/hr, maximum; 0.1 x 10^6 Btu/hr, normal) using Eclipse Model 80-AHO burners. The duct work and collection system was designed and installed by Dec-E-Tech Industrial Design Engineering. The source emits volatile organic compounds and organic solvents (used for clean-up). The UTM coordinates are Zone 17, 461.37 km East and 3142.02 km North.

The Standard Industrial Codes are: Major Group 27 - Printing/Publishing; Group No. 275 - Commercial Printing; Industrial Number 2751 - Commercial Printing, Letterpress and Screen.

The sources shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:
1. Application to Construct Air Pollution Sources, DER Form 17-1.202(1), received January 29, 1991.
2. Mr. Bruce P. Miller's letter with enclosure ("Guidelines for Developing a State Protocol for the Measurement of Capture Efficiency") dated May 15, 1990.
3. Technical Evaluation and Preliminary Determination dated April 4, 1991.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

GENERAL CONDITIONS:

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

a. Have access to and copy any records that must be kept under the conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and

GENERAL CONDITIONS:

records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

14. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SPECIFIC CONDITIONS:

1. The source may operate continuously (i.e., 8760 hrs/yr).

2. Total maximum allowable VOC (volatile organic compounds-organic solvents) emission limit shall not exceed 60.0 pounds per "run hour" and 71.3 tons per year, including clean-up solvent less any solvent waste shipped from the source [based on a minimum 70% capture and transport efficiency and a minimum 95% destruction efficiency (oxidizes at least 95% of the VOC measured as total combustible carbon to carbon dioxide and water) and includes 1 TPY clean-up solvent]. The 12 month rolling cumulative total VOC emissions from the press shall not exceed 71.3 TPY calculated on a monthly basis. The VOC emissions will be calculated based on actual daily input and annual test results for capture and destruction. EPA Method 24A shall be utilized to determine the VOC content of the ink pursuant to F.A.C. Rule 17-2.700 and 40 CFR 60, Appendix A (July, 1990 version).

3. The maximum input to the press is 180 pounds of VOC per "run hour" calculated on a daily basis. The permitted materials are as stated in the application.

SPECIFIC CONDITIONS:

4. The initial and annual demonstration of the capture efficiency shall be conducted using the U.S. EPA's "Guidelines for Developing a State Protocol for the Measurement of Capture Efficiency" (attached). The permittee shall notify the Department's Central District in writing of the protocol that will be used for the capture efficiency demonstration purpose at least 60 days prior to compliance testing.

5. Initial and annual compliance tests for the actual destruction efficiency (comparison of the inlet and outlet concentrations) of the catalytic incinerator shall be conducted using EPA Method 25, pursuant to F.A.C. Rule 17-2.700 and 40 CFR 60, Appendix A (July, 1990 version). Other test methods may be used as long as prior Department approval has been granted in writing.

6. A material balance scheme shall be used to assess and report the annual (verifiable monthly) VOC/solvent emissions associated with clean-up. The material balance scheme will account for the VOC/solvents received, any control measures used (must be quantifiable), and any VOC/solvents shipped off the facility by a properly licensed hauler.

7. The Department's Central District shall be notified in writing at least 15 days prior to conducting compliance tests pursuant to F.A.C. Rule 17-2.700(2).

8. Test reports shall be submitted to the Department's Central District no later than 45 days after the last sampling run of each test is completed pursuant to F.A.C. Rule 17-2.700(7).

9. This project is subject to all applicable provisions of F.A.C. Chapters 17-2 and 17-4 and 40 CFR (July, 1990 version).

10. The sources are subject to the applicable provisions of F.A.C. Rules 17-2.240: Circumvention; 17-2.250: Excess Emissions; and, 17-4.130: Plant Operation-Problems.

11. Objectionable odors shall not be allowed off plant property pursuant to F.A.C. Rules 17-2.620(2) and 17-2.600(1)(a)2.

12. Pursuant to F.A.C. Rule 17-2.600(1)(a)1., the catalytic incinerator is subject to the visible emissions standard of "no visible emissions" (5% opacity) except that visible emissions not

SPECIFIC CONDITIONS:

exceeding 20% opacity are allowed for up to three minutes in any one hour period. Initial and annual compliance tests shall be conducted using DER Method 9 pursuant to Table 700-1, F.A.C. Rule 17-2.700.

13. An annual operating report shall be submitted to the Department's Central District office by March 1 of each calendar year accounting for the annual VOC/solvent emissions, which shall minimally include source test results, quantifiable fugitives and clean-up VOCs/solvents.

14. Any modification pursuant to F.A.C. Rule 17-2.100, Modification, shall be submitted to the Department's Central District office and the Bureau of Air Regulation (BAR) office for approval.

15. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the BAR prior to 60 days before the expiration date of the permit (F.A.C. Rule 17-4.090).

16. An application for an operation permit must be submitted to the Department's Central District office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever comes first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed, noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rules 17-4.055 and 17-4.220).

Issued this _____ day
of _____, 1991

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

_____
STEVE SMALLWOOD, P.E., Director
Division of Air Resources Management

Florida Department of Environmental Regulation

Central District • 3319 Maguire Boulevard, Suite 232 • Orlando, Florida 32803-3767

Lawton Chiles, Governor — Carol M. Browner, Secretary

fp Spiralkote, Inc.
1200 Central Florida Parkway
Orlando, Florida 32821-9295

DRAFT

Attention: Carey Mann, Treasurer

Orange County - AP
W & H Flexorex CC 746 Printing Press
Permit No. AC48-157290
Change of Conditions

Dear Mr. Mann:

We are in receipt of your request for a change of the permit conditions. The conditions are changed as follows:

CONDITION
Expiration Date

FROM
4/15/91

TO
4/15/92

CONDITION
Specific Condition No. 5

FROM
5. The maximum permitted production capacity is 26 reams per hour. The permitted materials and utilization rates are as stated in the application.

TO
5. The maximum input to the press is 180 pounds of VOC per "run hour" calculated on a daily basis. The permitted materials are as stated in the application.

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION)	Initial / Date
Bruce Mitchell	
2. Div. of Air Resources	Initial / Date
3. Department of Environmental Regulation Twin Towers Office Building	Initial / Date
4. 2600 Blair Stone Road Tallahassee, FL 32399-2400	Initial / Date

RECEIVED
MAR 05 1991
DER BAQM

REMARKS:

Please review & provide comments. Since the lb/hr emission limit is not established by rule, is the 30 day rolling average really an issue here? If so, can we just raise the ton/month limit to 26.6 t/mo?

INFORMATION	
	Review & Return
	Review & File
	Initial & Forward

DISPOSITION	
	Review & Respond
	Prepare Response
	For My Signature
	For Your Signature
	Let's Discuss
	Set Up Meeting
	Investigate & Report
	Initial & Forward
	Distribute
	Concurrence
	For Processing
	Initial & Return

FROM:

DATE 3/4/91

PHONE

DRAFT

CONDITION
Permit Specific Condition No. 9

FROM

Emissions of volatile organic compounds shall not exceed 21.47 pounds per hour, 7.99 tons per month, and 95.88 tons per year, based on a minimum of 67% capture efficiency and a 90% destruction efficiency (oxidizes at least 90% of the VOC measured as total combustible carbon, to carbon dioxide and water) and includes 0.9 tons per year cleanup solvent.

TO

Emissions of Volatile Organic Compounds (VOC) shall not exceed 71.46 pounds per "run hour" and 95.88 tons per year including cleanup solvent less solvent waste shipped from the source. The source shall maintain a minimum of 67% capture efficiency and a minimum of 90% destruction efficiency (oxidizes at least 90% of the VOC measured as total combustible carbon, to carbon dioxide and water). The 12 month rolling cumulative total VOC emissions from the press will not exceed 95.88 tons/year calculated on a monthly basis. The VOC emissions will be calculated based on actual daily input and annual test results for capture and destruction and shall be submitted monthly. EPA Method 24A shall be utilized to determine the VOC content of the ink.

All other conditions remain the same.

This letter must be attached to your permit and becomes a part of that permit.

Sincerely,

A. Alexander, P.E.
Deputy Assistant Secretary

_____
Date

AA:jtj

Wayne
Janet Fi
Guidance
memo

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR - 8 1987

MEMORANDUM

SUBJECT: Clarification of New Source Review Policy on Averaging Times for Production Limitations

FROM: John S. Seitz, Director
Stationary Source Compliance Division
Office of Air Quality Planning and Standards

TO: Air Management Division Directors
Regions I, III and IX

Air and Radiation Division Director
Region V

Air and Waste Management Division Director
Region II

Air, Pesticides and Toxics Management Division Directors
Regions IV and VI

Air and Toxics Division Directors
Regions VII, VIII and X

On March 13, 1986 the Stationary Source Compliance Division issued the attached memorandum which describes EPA's policy on maximum allowable averaging times for production and operational limitations. The limitations addressed are those which restrict a source's potential to emit to below PSD/NSR major source or major modification thresholds. Since the issuance of this memorandum last March, there have been several attempts to misuse the policy and apply it to emission limitations, rather than to production/operational limitations. The purpose of this memorandum is to distinguish between EPA's policy on averaging times for production limitations versus emission limitations, and to clarify the proper implementation of the March 13, 1986 memorandum.

Production limitations place restrictions on a source's operating rate, or rate of material throughput. Examples of production limitations are: hours of operation, gallons of coating per job or per unit time, million BTU per unit time,

material processed per unit time. Federally enforceable limitations on these parameters may serve to limit a source's potential to emit to below major source thresholds. EPA's policy on the longest averaging times that are considered federally enforceable is set forth in the March 13, 1986 memorandum from Edward E. Reich. The longest averaging time generally acceptable for the purposes of practical Federal enforcement is one month, however, a source may seek approval of longer rolling averages as discussed in that memorandum.

Emission limitations place restrictions directly on the source's pollutant emission rate. Examples of emission limitations are: lb VOC/gal coating, lb VOC/hour, lb SO_2/MBTU, lb SO_2/hour, grains particulates/dscf. In order for emission limitations to be Federally enforceable from the practical stand point, they must be short term and specific so as to enable the Agency to determine compliance at any time. Emission limitations on a yearly basis alone (e.g., tons per year, or rolling yearly averages) do not satisfy EPA's requirements with respect to Federal enforceability. EPA's policy on averaging times for VOC emission limitations is stated in the January 20, 1984 memorandum from John O'Connor, Acting Director of OAQPS.

The March 13, 1986 Edward Reich memorandum describes EPA's policy on averaging times for production limitations which limit potential to emit to below major source or major modification thresholds. That memorandum states that the averaging time policy for production limitations does not apply to emission limitations. Therefore, limitations on a source's emission rate (e.g., lb VOC/unit time) designed to keep the source's potential emissions below NSR/PSD thresholds must comport with EPA policy on emission limitations. Sources may not use the March 13, 1986 memorandum on averaging times for production limitations to justify the use of longer (e.g., yearly or monthly) averaging times for emission limitations.

Any questions regarding this memorandum or the March 13, 1986 memorandum may be directed to Sally M. Farrell at FTS 382-2875.

Attachment

cc: Gary McCutchen, CPDD
David Soloman, CPDD
Marcia Spink, Region I
John Courcier, Region I
Kenneth Eng, Region II
Karl Mangels, Region II
Estena McGhee, Region III
Wayne Aronson, Region IV
Roger Pfaff, Region IV
Ron Van Mersbergen, Region V
Rizalino Castenares, Region V
John Behnam, Region VI
Stanley Spriuell, Region VI
Charlie Whitmore, Region VII
John Dale, Region VIII
Steve Frey, Region VIII
Wayne A. Blackard, Region IX
David Bray, Region X
Gregory Foote, OGC
Judy Katz, OECM

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

MAR 13 1986

MEMORANDUM

SUBJECT Time Frames for Determination of Applicability to New Source Review

FROM: Director
Stationary Source Compliance Division
Office of Air Quality Planning and Standards

TO Bruce P. Miller, Acting Chief
Air Programs Branch, Region IV

In a recent phone conversation between Roger Pfaff of your staff, and Sally Farrell of my staff, time frames for determination of compliance with permit restrictions on hours of operation, or rate of materials/fuel use were discussed. Specifically, inquiry was made as to whether SSCD considered a rolling yearly average on a daily basis (i.e. averaging some parameter over 365 days, where each day starts the summing/averaging period for a new year) as an appropriate measure of applicability to Prevention of Significant Deterioration (PSD) and nonattainment new source review (NSR).

A source may commit to limit its production by including federally enforceable restrictions on hours of operation or fuel and materials consumption in its permit. Limited operation of the source may serve to lower its emission rates to levels below those which trigger PSD/NSR review. Such permit limits are used by sources to avoid major source review.

At the NSR meetings in Denver this January, attended by new source review staff from Headquarters and all ten Regions, it was agreed that a month long period for these permit restrictions is the longest time frame that should be accepted as federally enforceable. Under the constraints of Section 113

			CONCURRENCES				
SYMBOL	EN-341	EN-341					
SURNAME	Farrell	Bindi					
DATE	2/10/86	2/10/86		2/11/86			

of the Clean Air Act it would, in practice, be difficult to enforce violations using a longer time frame, such as an annual average. Upon finding of a violation, Section 113 requires that EPA first issue a Notice of Violation. If the violation extends 30 days beyond notification, the Agency may then issue an order to comply or take civil action. If compliance is based on an annual average, there may be a considerable time lag before the violation can be enforced. Therefore, a one month limit is agreed to be the maximum time EPA should generally accept for avoiding a PSD/NSR threshold. However, if a source is unable to use the monthly limit (due to seasonal variations in production, for example), rolling periods of longer durations are also acceptable for determining applicability to major source review. With the year long rolling average on a daily basis, the source must demonstrate compliance for any consecutive 365 days, thereby averting the problems encountered with enforcing discrete annual averages. A twelve month rolling average (year long, on a twelve month basis) is the maximum time frame that would be accepted as federally enforceable.

It should be emphasized that the averaging periods recommended are for the purpose of determining applicability to new source review. The above policy is not to be extended to determination of compliance with emission limitations.

If you have any questions, please contact Sally M. Farrell at FTS 382-2875.

Edward E. Reich

cc: Marcia Spink, Region I
Ken Eng, Region II
Ben Wykijewycz, Region III
Roger Pfaff, Region IV
Ron Van Mersbergen, Region V
Troy Oberg, Region VI
Dan Rodriguez, Region VII
Steven Frey, Region VIII
Matt Haber, Region IX
David Bray, Region X
Kirt Cox, OAQPS

EN-341:S.Farrell:mrd:3-4-86:Disk#1:Draft#1:3/3/86:Final#1:3/4/86.

January 28,1991

Enclosed is a copy of our updated request to amend our permit AC48-157290 for the WHI 52" press.

Please replace our original request of December 10,1990 with this version.

Minor changes in the wording have been made. The spread sheet for gathering daily emissions has been changed to make it easier to follow the math.

Ed J. Ward Jr.

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

	Initial	Date
1. TO: (NAME, OFFICE, LOCATION) Bruce Mitchell		
2. Div. of Air Resources		
3.		
4.		

REMARKS:

PYR

RECEIVED

FEB 12 1991

DER - BAQM

INFORMATION

- Review & Return
- Review & File
- Initial & Forward

DISPOSITION

- Review & Respond
- Prepare Response
- For My Signature
- For Your Signature
- Let's Discuss
- Set Up Meeting
- Investigate & Report
- Initial & Forward
- Distribute
- Concurrence
- For Processing
- Initial & Return

FROM:

DATE 2/11/91

PHONE

(2)

SINCE 1934

fp Spiralkote, Inc.

A Subsidiary Of Fleming Packaging Corporation

January 25, 1991

Mr. John Turner
Air Permitting Engineer
Florida DER- Central District
3319 Maguire Road
Suite 232
Orlando, FL 32803

RE: WH II 52" 746 ST 6 COLOR PRESS WITH ONE DOWNSTREAM FLEXO COATER PERMIT AC48-157290 → expires 4/15/91

Dear Mr. Turner:

Please amend our permit as described below to reflect actual maximum operating conditions instead of "average conditions" which were the basis of the original permits.

An explanation of the reasons for each of the changes requested is explained on the attached "Appendix Sheets".

No change in annual tons emitted will occur.

Page 1 paragraph 2

From:	a minimum 90%
To:	a targeted 90% No
From:	minimum VOC captured
To:	the target VOC capture. (note that "the minimum VOC reduction efficiency of 60.3% for the system" will remain the same)

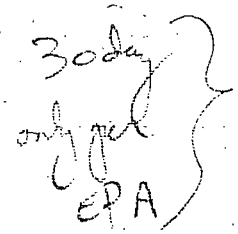
(page 4 of 7: Specific Conditions)
Specific Condition 5:

From:	The maximum permitted production capacity is 26 reams per hour. The permitted materials and utilization rates are as stated in the application.
To:	The maximum input to the press is 180 pounds of VOC per "run hour" calculated on a daily basis. ok

Specific Condition 9:

From: Emissions of volatile organic compounds shall not exceed 21.47 pounds per hour, 7.99 tons per month, and 95.88 tons per year, based on a minimum of 67% capture efficiency and a 90% destruction efficiency (oxidizes at least 95% of the VOC measured as total combustible carbon, to carbon dioxide and water) and includes .9 ton per year cleanup-solvent.

To: Emissions shall not exceed 95.88 tons per year or 71.46 pounds per "run hour" including cleanup solvent less solvent waste shipped as hazardous waste. The overall (capture + destruction) control shall be 60.3% of VOC input to the press. Typical capture efficiency will be 67 to 85% (target 67%) and typical destruction of captured VOC (oxidizes captured VOC measured as total combustible carbon to carbon dioxide and water) will be between 80 and 98% (target 90%). The 12 month rolling cumulative total VOC emissions from the press will not exceed 95.88 tons/year calculated on a monthly basis. The VOC emissions will be calculated based on actual daily input and annual test results for capture and destruction.



If you have any questions, please don't hesitate to call.

Sincerely,

fp SPIRALKOTE, INC.

CAREY MANN
TREASURER

ED WARD, JR
EXECUTIVE VICE PRESIDENT

jac

encl.

cc: Bruce Mitchell, Dennis Nester, Stephen Neck, Bruno Ferraro, Jerome Guidry, Chris Johns, J.R. Wilson

APPENDIX I

EXPLANATIONS

Specific Condition 5:

Change maximum production from " 26 reams per hour" to "180# of solvent input per run hour."

Purpose of Change:

To provide DER and Spiralkote with a measurable quantity, available on a 24 hr basis, by which emissions can be estimated.

Reams per hour is a very poor predictor of solvent input because the pounds of solvent input per ream varies dramatically from one grade to another.

For example:

GRADE	POUNDS OF SOLVENT PER REAM
Polyethylene Bread Wrap	Less than 2#
Orange Juice Paper Labels	3 to 4#
Christmas Gift Wrap	5 to 7#
Refrigerated Biscuit Labels	7 to 9#

The 180#/hour input solvent load would allow Spiralkote to run 930 fpm on standard 29.06" wide orange juice paper at 4# per ream solvent input which is 33% faster than the typical job. 930 fpm represents the maximum speed at which we can dry and cure our inks and coatings under the best of conditions.

The 180# per hour solvent input assumes applying approximately 90# of solvent to:

A. the central impression printing decks with its associated 150#/hour incinerator.

B. and the downstream flexo coater and its associated 120#/hour incinerator.

Daily records similar to Appendix III will be used to verify compliance.

APPENDIX II

Specific Condition 7:

A. Change from " 21.47 pounds of emissions per hour" to " 71.46#/run hour".

180 lb/hr @ 60.3 wt% = 71.46 lbs/hr ok

Purpose of Change:

To adjust the permit to reflect actual maximum emissions during actual maximum input conditions of 180#/run hour. Annual tests should occur at this level, not the average level. The 21.47#/per hr. emission rate is an average condition. It is based on 240 tons of annual input which is overall controlled at a rate of 60.3% to yield 95 tons of emissions plus 0.88 tons of cleanup solvent emissions.

95 tons x 2000 #/ton/8760 permitted hours = 21.69# emissions per average hour every hour of the year.

The press does not run 8760 hours of the year. Typically it runs 2200 (25%) to 4000 (45%) of the 8760 hours depending on the mixture of labels being produced. The emissions are concentrated in those full speed run hours.

The typical year (8760 hours) running citrus labels, will consist of:

2560 unmanned hours (29% of 8760 hrs) of no input on weekends and holidays
6200 manned hours (71% of 8760 hrs) of which:

3700 hours (42% of 8760 hrs) (60% of 6200 hrs) are makeready and maintenance with about 6#/hr solvent input from the 6 ink decks plus 1#/hr solvent input from the varnish deck. (5 tons emissions)

2500 hrs (29% of 8760) (40% of 6200 hrs) are run hours with 100# to 180#/hr solvent input. (70 tons emissions at 140#/hr)

Calculation Example for 2500 hrs @ 140#/hr input

2500 hrs x 140# x (.67 capture x (1 - .90 destruction)/ 2,000 #/ton
= 12 tons emissions thru incinerator

2500 hrs x 140#/hr x (1 - .67 capture)/ 2,000#/ton
= 58 tons fugitive emissions
(70 tons emissions at 140#/hr input)

APPENDIX II - Specific Condition 7 continued:

The typical day will consist of:

HOURS

6 makeready for orange juice labels
2 run at 500-800 fpm
1 clean printing plates to eliminate fuzzy printing

6 makeready for grapefruit juice label
7 run at 500-800 fpm
2 maintenance and reweb the press because of paper break

---

24 manned hours with 9 run hours (37.5%)

B. Change from " 67% capture and 90% destruction" to: 60.3% overall control of solvent input to the press.

Purpose of Change:

To acknowledge that capture can be improved while destruction, with catalytic systems, is 95% only with new charges of catalyst. The catalyst constantly degrades from that point onward. This change will provide the incentive to increase capture and lower operating costs be extending useful catalyst life.

1. capture was set by time design
2. 95% reduction of VOC solvent in the appl. gas to be emitted at least at 90%

C. Change from "7.99 tons/month emissions" to: The 12 month rolling cumulative total emissions shall not exceed 95.88 tons.

Purpose of Change:

To reflect the fact that business has peak seasons, lasting several months, which may be 2 or 2.5 times the average monthly emissions. Christmas and the orange juice harvest season are the usual cause of these peaks.

SINCE 1934

fp Spiralkote, Inc.

A Subsidiary Of Fleming Packaging Corporation

RECEIVED

DEC 17 1990

DER - BAQM

December 10, 1990

Mr. Clair Fancy, P.E.
Bureau Chief, Air Regulation
Division of Air Resources Management
Florida Department of Environmental Regulation
Twin Towers Office Bldg.
2600 Blairstone Road
Tallahassee FL 32399-2400

RE: WH II 52" 746 ST 6 COLOR PRESS WITH ONE DOWNSTEAM FLEXO COATER
PERMIT AC48-157290

Dear Mr. Fancy:

Please amend our permit as described below to reflect actual maximum operating conditions instead of "average conditions" which were the basis of the original permits.

An explanation of the reasons for each of the changes requested is explained on the attached "Appendix Sheets".

No change in annual tons emitted will occur.

Page 1 paragraph 2

From:	a minimum 90%
To:	a targeted 90%.
From:	minimum VOC captured
To:	the target VOC capture.

(page 4 of 7 Specific Conditions)

Item 5 From: The maximum permitted production capacity is 26 reams per hour. The permitted materials and utilization rates are as stated in the application.

To: The maximum input to the press is 180 pounds of VOC per "run hour".

1200 CENTRAL FLORIDA PARKWAY ORLANDO, FLORIDA 32821-9295 TELEPHONE (407) 859-7780 FAX (407) 857-0430

Item 7 9 From: Emissions of volatile organic compounds shall not exceed 21.47 pounds per hour, 7.99 tons per month, and 95.88 tons per year, based on a minimum of 67% capture efficiency and a 90% destruction efficiency (oxidizes at least 95% of the VOC measured as total combustible carbon, to carbon dioxide and water) and includes .9 ton per year cleanup-solvent. 90

To: Emissions lbs shall not exceed 95.88 tons per year or 71.46 per "run hour". The overall (capture + destruction) destruction efficiency shall be 60.3% of VOC input to the press including cleanup solvent less waste solvent shipped as hazardous waste. Typical capture efficiency will be 67 to 85% (target 67%) and typical destruction of captured VOC (oxidizes captured VOC measured as total combustible carbon to carbon dioxide and water) will be between 80 and 98% (target 90%) The 12 month rolling cumulative total VOC emissions from to the press will not exceed 95.88 tons/year. OK 140 OK

If you have any questions, please don't hesitate to call.

Sincerely,

fp SPIRALKOTE, INC.

E J Ward Jr

ED WARD, JR
EXECUTIVE VICE PRESIDENT

jac

encl.

cc: John Turner, Dennis Nester, Stephen Neck, Bruno Ferraro, Jerome Guidry, Chris Johns, J.R. Wilson

APPENDIX I

EXPLANATIONS

Item 5 Change maximum production from 26 reams per hour to 180# of solvent input per "run hour".

Purpose of Change:

To provide DER and Spiralkote with a measurable quantity, available on a daily basis, by which potential emissions can be predicted.

Reams per hour is a very poor predictor of solvent input because the pounds of solvent input per ream varies dramatically from one grade to another.

For example:

GRADE	POUNDS OF SOLVENT PER YEAR
Polyethylene Bread Wrap	Less than 2#
Orange Juice Paper Labels	3 to 4#
Christmas Gift Wrap	5 to 7#
Refrigerated Biscuit Labels	7 to 9#

The 180#/hour input solvent load would allow Spiralkote to run 930 fpm on standard 29.06" wide orange juice paper at 4# per ream solvent input which is 33% faster than the typical job. 930 fpm represents the maximum speed at which we can dry and cure our inks and coatings under the best of conditions.

The 180# per hour solvent input assumes applying approximately 90# of solvent to:

A. the central impression printing decks with its associated 150#/hour incinerator.

B. and the downstream flexo coater and its associated 120#/hour incinerator.

Daily records similar to Appendix III will be used to verify compliance.

APPENDIX II

Item 7 A. Change from 21.47 pounds of emissions per hour to 71.46#/run hour.

Purpose of Change:

180 lb/hr @ 60.3% reduction = 71.46 lb/hr

To adjust the permit to reflect actual maximum emissions during actual maximum input conditions of 180#/run hour. Annual tests should occur at this level, not the average level. The 21.47#/per hr emission rate is an average condition. It is based on 240 tons of annual input which is overall destruction at a rate of 60.3% to yield 95 tons of emissions plus 0.88 tons of cleanup solvent emissions.

95 tons x 2000 #/ton/8760 permitted hours = 21.69# emissions per average hour every hour of the year.

The press does not run 8760 hours of the year. Typically it runs 2200 (25%) to 4000 (45%) of the 8760 hours depending on the mixture of labels being produced. The emissions are concentrated in those full speed run hours.

The typical year (8760 hours) running citrus labels, will consist of:

2560 unmanned hours (29%) of no input on weekends and holidays
6200 manned hours (71%) of which:
- 3700 hours (42%) are makeready, maintainence and cleanup with 7#/hours of solvent input. (5tons emissions)
- 2500 hours (29%) are run hours with 100# to 180#/hour solvent input. (50 to 89 ton emissions)

The typical day will consist of:

HOURS

6 makeready for orange juice label
2 run at 500-800 fpm
1 clean printing plates to eliminate fuzzy printing

6 makeready for grapefruit juice label
7 run at 500-800 fpm
2 maintainence and reweb the press because of paper break

---

24 manned hours with 9 run hours (37.5%)

APPENDIX II - Item 7 continued

B. Change from 67% capture and 90% destruction to 60.3% overall destruction of solvent input.

Purpose of Change:

To acknowledge that capture can be improved while destruction with catalytic systems is 95% only with new charges of catalyst. The catalyst constantly degrades from that point onward. This change will provide the incentive to increase capture and lower operating costs by extending useful catalyst life.

1. capture was set by the design of 2. 95% retention was shown in the app. needs to be maintained.

C. Change from 7.99 tons/month emissions to: The 12 month rolling cumulative total emissions shall not exceed 95.88 tons.

Purpose of Change:

To reflect the fact that business has peak seasons, lasting several months, which may be 2 or 2.5 times the average monthly emissions. Christmas and the orange juice harvest season are the usual cause of these peaks.

SINCE 1934

fp Spiralkote, Inc.

A Subsidiary Of Fleming Packaging Corporation

Tally issued the T.C. VT (1)

December 7, 1990

Mr. Clair Fancy, P.E.
Bureau Chief, Air Regulation
Division of Air Resources Mgmt.
Florida Dept. of
Environmental Regulation
Twin Towers Office Bldg.
2600 Blairstone Road
Tallahassee, FL 32399-2400

Re: 36" WH-I 6 COLOR 746 CC PRESS WITH TWO DOWNSTREAM FLEXO GRAVURE COATER

PERMIT A048-137831

Dear Mr. Fancy:

Please amend our permit as described below to reflect actual maximum operating conditions instead of "average conditions" which were the basis of the original permits.

An explanation of the reasons for each of the changes requested is explained on the attached "Appendix Sheets".

No change in annual tons emitted will occur.

(page 4 of 7 Specific Conditions)

Item 5. From: The hours of operation shall not exceed 520 per month and 6240 annually.

To: This source is permitted to operate 8760 hours per year.

Item 6. From: The maximum rated production capacity is 26 reams per hour based on 3000 square feet per ream.

To: The maximum input to the press is 180 pounds of VOC per "run hour".

1200 CENTRAL FLORIDA PARKWAY ORLANDO, FLORIDA 32821-9295 TELEPHONE (407) 859-7780 FAX (407) 857-0430

Item 7. From: Emission of volatile organic compounds and organic solvents shall not exceed 22.8 pounds per hour, 5.9 tons per month, and 71.3 tons per year, based on a minimum of 70% capture efficiency and a 95% destruction efficiency (oxidizes at least 95% of the VOC measured as total combustible carbon, to carbon dioxide and water) and includes 1 ton per year of clean up - solvent.

To: Emissions shall not exceed 71.3 tons per year or 60# per "run hour". The overall (capture and destruction) destruction efficiency shall be shall be 66.5% of VOC input to the press including cleanup solvent less waste solvent shipped as hazardous waste. Typical capture efficiency will be 70 to 85% (target 70%) and typical destruction of captured VOC (oxidizes captured VOC measured as total combustible carbon to carbon dioxide and water) will be between 80 and 98%. (Target 95%) The 12 month rolling cummulative total VOC emissions from the press will not exceed 71.3 tons.

If you have any qeustions on this matter please don't hesitate to call me at (407) 859-7780.

Sincerely,

fp SPIRALKOTE, INC.

Edward p

ED WARD, JR
EXECUTIVE VICE PRESIDENT PRODUCTION

jac

cc: John Turner, Dennis Nester, Stephen Neck, Bruno Ferraro, Jerome Guidry, J.R. Wilson, Chris Johns

APPENDIX I

EXPLANATIONS

Item 5. Change operating hours from 6248 to 8760

Purpose of Change:

To inform the Florida DER that some weeks and months we have to run 6-7 days a week to meet the seasonal demands of Christmas and the orange juice harvest season.

The actual emission hours at run speeds will be 2200 to 4000 hours per year depending on the mixture of labels being produced.

The typical year, (8760 hours) running citrus labels, will consist of:

2560 unmanned hours (29%) of no input on weekends and holidays
6200 manned hours (71%) of which:
- 3700 hours (42%) are makeready, maintenance and cleanup with 7#/hour of solvent input. (5 tons emissions)
- 2500 hours (29%) are run hours with 100# to 180#/hr solvent input. (50 to 89 tons emissions)

The typical day will consist of:

HOURS	
6	makeready for orange juice label
2	run at 500 - 800 fpm
1	clean printing plates to eliminate fuzzy printing
6	makeready for grapefruit juice label
7	run at 500 - 800 fpm
2	maintenance and reweb the press because of paper break
24	Manned hours with 9 run hours (38%)

APPENDIX II

Item 6. Change maximum production from 26 reams per hour to 180# of solvent input per hour.

Purpose of Change:

To provide the Florida DER and Spiralkote with a measurable quantity, available on a daily basis, by which potential emissions can be predicted.

Reams per hour is a very poor predictor of solvent input because the pounds of solvent input per ream varies dramatically from one grade to another.

For example:

GRADE	POUNDS OF SOLVENT PER YEAR
Polyethylene bread wrap	2 or less
Orange juice paper labels	3 to 4
Christmas gift wrap	5 to 7
Refrigerated biscuit labels	7 to 9

The 180#/ per hour input solvent load would allow Spiralkote to run 930 fpm on standard 29.06" wide orange juice paper at 4# per ream solvent input which is 33% faster than the typical job. 930 fpm represents the maximum speed at which we can dry and cure our inks and coatings under the best of conditions.

The 180#/per hour solvent input assumes applying approximately 90# of solvent to:

A. the central impression printing decks with its associated 120#/per hr incinerator.

B. and the flexogravure deck I and its associated 120#/per hr incinerator or the flexogravure deck II and its associated 120#/per hr incinerator.

Daily records similar to Appendix IV will be used to verify Compliance. (see attachment)

APPENDIX III

Item 7. A. change from 22.8# of emissions per hour to 60#/per hr.

Purpose of Change: To adjust the permit reflect actual maximum emissions during actual maximum input conditions of 180#/run hour. Annual tests should occur at this level, not the average level.

The 22.8#/per hr emission rate is an average condition.It is based on 209.0 tons of annual in-put which are overall destructed at a rate of 66.5% to yield 70.3 ton emissions plus 1.0 tons of clean up solvent. 71.3 tons x 2000 #/ton/6240 permitted hours = 22.8# emissions per average hour every manned hour of the year.

The press does not operate every manned hour. Typically it only operates 35-64% of the manned hours and only 25-45% of the 8760 total hours per year.

B. Change from 70% capture and 95% destruction to 66.5% overall destruction of solvent input.

Purpose of Change: To acknowledge that capture can be improved while destruction with catalytic systems is 95% only with new charges of catalyst. The catalyst constantly degrades from the point onward. This change will provide the incentive to increase capture and lower operating costs by extending useful catalyst life.

C. Change from 5.9 tons/month emissions to: The 12 month rolling cumulative total emissions shall not exceed 71.3 tons.

Purpose of Change: To reflect the fact that business has peak seasons, lasting several months, which may be 2 or 2.5 times the average monthly emissions. Christmas and the orange juice harvest season are the usual causes of these peaks.

(2)

JT

SINCE 1934

fp Spiralkote, Inc.

A Subsidiary Of Fleming Packaging Corporation

December 10, 1990

Mr. Clair Fancy, P.E.
Bureau Chief, Air Regulation
Division of Air Resources
Management
Florida Department of Environmental
Regulation
Twin Towers Office Bldg.
2600 Blairstone Road
Tallahassee FL 32399-2400

RE: WH II 52" 746 ST 6 COLOR PRESS WITH ONE DOWNSTEAM FLEXO COATER
PERMIT AC48-157290

Dear Mr. Fancy:

Please amend our permit as described below to reflect actual maximum operating conditions instead of "average conditions" which were the basis of the original permits.

An explanation of the reasons for each of the changes requested is explained on the attached "Appendix Sheets".

No change in annual tons emitted will occur.

Page 1 paragraph 2

From:	a minimum 90%
To:	a targeted 90%.
From:	minimum VOC captured
To:	the target VOC capture.

(page 4 of 7 Specific Conditions)

Item 5 From: The maximum permitted production capacity is 26 reams per hour. The permitted materials and utilization rates are as stated in the application.

To: The maximum input to the press is 180 pounds of VOC per "run hour".

1200 CENTRAL FLORIDA PARKWAY · ORLANDO, FLORIDA 32821-9295 TELEPHONE (407) 859-7780 FAX (407) 857-0430

Item 7 From: Emissions of volatile organic compounds shall not exceed 21.47 pounds per hour, 7.99 tons per month, and 95.88 tons per year, based on a minimum of 67% capture efficiency and a 90% destruction efficiency (oxidizes at least 95% of the VOC measured as total combustible carbon, to carbon dioxide and water) and includes .9 ton per year cleanup-solvent.

To: Emissions shall not exceed 95.88 tons per year or 71.46 per "run hour". The overall (capture + destruction) destruction efficiency shall be 60.3% of VOC input to the press including cleanup solvent less waste solvent shipped as hazardous waste. Typical capture efficiency will be 67 to 85% (target 67%) and typical destruction of captured VOC (oxidizes captured VOC measured as total combustible carbon to carbon dioxide and water) will be between 80 and 98% (target 90%) The 12 month rolling cumulative total VOC emissions from to the press will not exceed 95.88 tons/year.

If you have any questions, please don't hesitate to call.

Sincerely,

fp SPIRALKOTE, INC.

Ed Ward Jr

ED WARD, JR
EXECUTIVE VICE PRESIDENT

jac

encl.

cc: John Turner, Dennis Nester, Stephen Neck, Bruno Ferraro, Jerome Guidry, Chris Johns, J.R. Wilson

January 28,1991

Enclosed is a copy of our updated request to reissue our permit A048-137831 for the WHI 36" press.

Please replace our original request of December 7, 1990 with this formal application which was requested by Bruce Mitchell.

Minor changes in the wording have been made. The spread sheet for gathering daily emissions has been changed to make it easier to follow the math.

Ed J. Ward Jr.

SINCE 1934

fp Spiralkote, Inc.

A Subsidiary Of Fleming Packaging Corporation

Fully inside the AC

(3)

January 22, 1991

Mr. Clair Fancy, P.E.
Bureau Chief, Air Regulation
Division of Air Resources Mgmt.
Florida Dept. of
Environmental Regulation
Twin Towers Office Bldg.
2600 Blairstone Road
Tallahassee, FL 32399-2400

Re: 36" WH-I 6 COLOR 746 CC PRESS WITH TWO DOWNSTREAM FLEXOGRAVURE COATER PERMIT A048-137831

Dear Mr. Fancy:

Please reissue our permit as described below to reflect actual maximum operating conditions instead of "average conditions" which were the basis of the original permits.

An explanation of the reasons for each of the changes requested is explained on the attached "Appendix Sheets".

No change in annual tons emitted will occur.

(page 4 of 7 Specific Conditions)

Specific Condition 5:

From: The hours of operation shall not exceed 520 per month and 6240 annually.

To: This source is permitted to operate 8760 hours per year.

Specific Condition 6:

From: The maximum rated production capacity is 26 reams per hour based on 3000 square feet per ream.

To: The maximum input to the press is 180 pounds of VOC per "run hour" calculated on a daily basis.

1200 CENTRAL FLORIDA PARKWAY ORLANDO, FLORIDA 32821-9295 TELEPHONE (407) 859-7780 FAX. (407) 857-0430

Specific Condition 7:

From: Emission of volatile organic compounds and organic solvents shall not exceed 22.8 pounds per hour, 5.9 tons per month, and 71.3 tons /year tons based on a minimum of 70% capture efficiency and a 95% destruction efficiency (oxidizes at least 95% of the VOC measured as total combustible carbon, to carbon dioxide and water) and includes 1 ton per year of clean up - solvent.

To: Emissions shall not exceed 71.3 tons per year or 60# per "run hour" including cleanup solvent less solvent waste shipped as hazardous waste. The overall (capture and destruction) control shall be 66.5% of VOC input to the press. Typical capture efficiency will be 70 to 85% (target 70%) and typical destruction of captured VOC (oxidizes captured VOC measured as total combustible carbon to carbon dioxide and water) will be between 80 and 98%. (Target 95%) The 12 month rolling cumulative total VOC emissions from the press will not exceed 71.3 tons calculated on a monthly basis. The VOC Emissions will be calculated based on actual daily input and annual tests (for capture and destruction).

If you have any questions on this matter please don't hesitate to call me at (407) 859-7780.

Sincerely,

fp SPIRALKOTE, INC.

CAREY MANN
TREASURER

ED WARD, JR
EXECUTIVE V-P
PRODUCTION

jac

cc: John Turner, Dennis Nester, Stephen Neck, Bruno Ferraro, Jerome Guidry, J.R. Wilson, Chris Johns

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Printing Facility [ ] New[1] [X] Existing[1]

APPLICATION TYPE: [ ] Construction [ ] Operation [X] Modification

COMPANY NAME: fp Spiralkote, Inc. COUNTY: Orange

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Olympic 746 flexogra printing & coating unit & associated catyltic incinerator

SOURCE LOCATION: Street 1200 Central Florida Parkway City Orlando, Fl 32821 9295

UTM: East 461370 North 3142050

Latitude 28 ° 24 ' 21 "N Longitude 81 ° 23 ' 40 "W

APPLICANT NAME AND TITLE: Carey Mann, Treasurer

APPLICANT ADDRESS: 1200 Central Florida Parkway Orlando, FL 32821-9295

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of fp Spiralkote, Inc.

I certify that the statements made in this application for a Operation permit are true, correct and complete to the best of my knowledge and belief. Furt I agree to maintain and operate the pollution control source and pollution cont facilities in such a manner as to comply with the provision of Chapter 403, Flor Statutes, and all the rules and regulations of the department and revisions thereof. also understand that a permit, if granted by the department, will be non-transfera and I will promptly notify the department upon sale or legal transfer of the permit establishment.

*Attach letter of authorization

Signed: _____

Carey Mann, Treasurer
Name and Title (Please Type)

Date: 01-22-91 Telephone No. 407 859-7780

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project h been ~~designed~~/examined by me and found to be in conformity with modern enginee principles applicable to the treatment and disposal of pollutants characterized in permit application. There is reasonable assurance, in my professional judgment,

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

APPENDIX I EXPLANATIONS

Specific Condition 5: Change operating hours from 6248 to 8760

Purpose of Change: To inform the Florida DER that some weeks and months we have to run 6-7 days a week to meet the seasonal demands of Christmas and the orange juice harvest season.

The actual emission hours at run speeds will be 2200 to 4000 hours per year depending on the mixture of labels being produced.

The typical year, (8760 hours) running citrus labels, will consist of:

2560 unmanned hours (29% of 8760 hrs) of no input on weekends and holidays.
6200 manned hours (71% of 8760 hrs) of which:

3700 hours (42% of 8760 hrs) (60% of 6200 hrs) are makeready and maintenance with about 6#/hr solvent input from the 6 ink decks plus 1#/hr solvent input from the varnish deck. (5 tons emissions)

2500 hours (29% of 8760 hrs) (40% of 6200 hrs) are run hours with 100# to 180#/hr solvent input. (59 tons emissions at 140#/hr)

Calculation Example:

2500 hrs x 140#/hr x (70% capture x (1 -.95 destruction)/ 2,000#/ton
= 6 tons emissions thru incinerator

+2500 hrs x 140#/hr x (1-.70 capture) / 2,000#/ton
= 53 tons fugitive emissions
59 tons emissions at 140#/hr

The typical day will consist of:

HOURS

6 makeready for orange juice label
2 run at 500 - 800 fpm
1 clean printing plates to eliminate fuzzy printing

6 makeready for grapefruit juice label
7 run at 500 - 800 fpm
2 maintenance and reweb the press because of paper break

---

24 Manned hours with 9 run hours (38%)

APPENDIX II

Specific Condition 6. Change maximum production from 26 reams per hour to 180# of solvent input per hour.

Purpose of Change:

To provide the Florida DER and Spiralkote with a measurable quantity, available on a 24 hr basis, by which emissions can be estimated.

Reams per hour is a very poor predictor of solvent input because the pounds of solvent input per ream varies dramatically from one grade to another.

For example:

GRADE	POUNDS OF SOLVENT PER REAM
Polyethylene bread wrap	2 or less
Orange juice paper labels	3 to 4
Christmas gift wrap	5 to 7
Refrigerated biscuit labels	7 to 9

The 180#/ per hour input solvent load would allow Spiralkote to run 930 fpm on standard 29.06" wide orange juice paper at 4# per ream solvent input which is 33% faster than the typical job. 930 fpm represents the maximum speed at which we can dry and cure our inks and coatings under the best of conditions.

The 180#/per hour solvent input assumes applying approximately 90# of solvent to:

A. the central impression printing decks with its associated 120#/per hr incinerator.

B. and the flexogravure deck I and its associated 120#/per hr incinerator or the flexogravure deck II and its associated 120#/per hr incinerator.

Daily records similar to Appendix IV will be used to verify Compliance. (see attachment)

APPENDIX III

Specific Condition 7. A. Change from 22.8# of emissions per hour to 60#/per hr.

Purpose of Change: To adjust the permit to reflect actual maximum emissions during actual maximum input conditions of 180#/run hour. Annual tests should occur at this level, not the average level.

The 22.8#/per hr emission rate is an average condition. It is based on 209.0 tons of annual in-put which are overall destructed at a rate of 66.5% to yield 70.3 ton emissions plus 1.0 tons of clean up solvent. 71.3 tons x 2000 #/ton/6240 permitted hours = 22.8# emissions per average hour every manned hour of the year.

The press does not operate every manned hour. Typically it only operates 35-64% of the manned hours and only 25-45% of the 8760 total hours per year.

B. Change from 70% capture and 95% destruction to 66.5% overall control of solvent input to the press.

Purpose of Change: To acknowledge that capture can be improved while destruction with catalytic systems is 95% only with new charges of catalyst. The catalyst constantly degrades from the point onward. This change will provide the incentive to increase capture and lower operating costs by extending useful catalyst life.

C. Change from 5.9 tons/month emissions to: The 12 month rolling cumulative total emissions shall not exceed 71.3 tons.

Purpose of Change: To reflect the fact that business has peak seasons, lasting several months, which may be 2 or 2.5 times the average monthly emissions. Christmas and the orange juice harvest season are the usual causes of these peaks.

SINCE 1934

fp Spiralkote, Inc.

A Subsidiary Of Fleming Packaging Corporation

January 22, 1991

Mr. Clair Fancy, P.E.
Bureau Chief, Air Regulation
Division of Air Resources Mgmt.
Florida Dept. of
Environmental Regulation
Twin Towers Office Bldg.
2600 Blairstone Road
Tallahassee, FL 32399-2400

Re: 36" WH-I 6 COLOR 746 CC PRESS WITH TWO DOWNSTREAM FLEXOGRAVURE COATER PERMIT A048-137831

Dear Mr. Fancy:

Please reissue our permit as described below to reflect actual maximum operating conditions instead of "average conditions" which were the basis of the original permits.

An explanation of the reasons for each of the changes requested is explained on the attached "Appendix Sheets".

No change in annual tons emitted will occur.

(page 4 of 7 Specific Conditions)

Specific Condition 5:

From: The hours of operation shall not exceed 520 per month and 6240 annually.

To: This source is permitted to operate 8760 hours per year.

Specific Condition 6:

From: The maximum rated production capacity is 26 reams per hour based on 3000 square feet per ream.

To: The maximum input to the press is 180 pounds of VOC per "run hour" calculated on a daily basis.

1200 CENTRAL FLORIDA PARKWAY ORLANDO, FLORIDA 32821-9295 TELEPHONE (407) 859-7780 FAX. (407) 857-0430

Specific Condition 7:

From: Emission of volatile organic compounds and organic solvents shall not exceed 22.8 pounds per hour, 5.9 tons per month, and 71.3 tons /year tons based on a minimum of 70% capture efficiency and a 95% destruction efficiency (oxidizes at least 95% of the VOC measured as total combustible carbon, to carbon dioxide and water) and includes 1 ton per year of clean up - solvent.

To: Emissions shall not exceed 71.3 tons per year or 60# per "run hour" including cleanup solvent less solvent waste shipped as hazardous waste. The overall (capture and destruction) control shall be 66.5% of VOC input to the press. Typical capture efficiency will be 70 to 85% (target 70%) and typical destruction of captured VOC (oxidizes captured VOC measured as total combustible carbon to carbon dioxide and water) will be between 80 and 98%. (Target 95%) The 12 month rolling cumulative total VOC emissions from the press will not exceed 71.3 tons calculated on a monthly basis. The VOC Emissions will be calculated based on actual daily input and annual tests (for capture and destruction).

If you have any questions on this matter please don't hesitate to call me at (407) 859-7780.

Sincerely,

fp SPIRALKOTE, INC.

CAREY MANN
TREASURER

ED WARD, JR
EXECUTIVE V-P
PRODUCTION

jac

cc: John Turner, Dennis Nester, Stephen Neck, Bruno Ferraro, Jerome Guidry, J.R. Wilson, Chris Johns

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

$200 pd. 1-29-91 Recpt.# 151939

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

AC48-192219

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Printing Facility [ ] New[1] [X] Existing[1]

APPLICATION TYPE: [ ] Construction [ ] Operation [X] Modification

COMPANY NAME: fp Spiralkote, Inc. COUNTY: Orange

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Olympic 746 flexographic printing & coating unit & associated catyltic incinerator

SOURCE LOCATION: Street 1200 Central Florida Parkway City Orlando, Fl 32821-9295

UTM: East 461370 North 3142050

Latitude 28 ° 24 ' 21 "N Longitude 81 ° 23 ' 40 "W

APPLICANT NAME AND TITLE: Carey Mann, Treasurer

APPLICANT ADDRESS: 1200 Central Florida Parkway Orlando, FL 32821-9295

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of fp Spiralkote, Inc.

I certify that the statements made in this application for a Operation permit are true, correct and complete to the best of my knowledge and belief. Further I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed:

Carey Mann, Treasurer
Name and Title (Please Type)

Date: 01-22-91 Telephone No. 407 859-7780

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been ~~designed~~/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, th

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed _____

Jerome Guidry, P.E.
Name (Please Type)

Post Buckley, Schuh & Jernigan, Inc.
Company Name (Please Type)

6635 E. Colonial Drive Orlando FL 32807
Mailing Address (Please Type)

Florida Registration No. 32589 Date: 1-29-91 Telephone No. 407 277-4443

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

See attached letters requesting permits be reissued to reflect actual actual working conditions instead of "average" conditions.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction _____ Completion of Construction _____

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

A048-137831 Issued 2-9-88 Expires 1-25-93

APPENDIX I EXPLANATIONS

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fp SPIRALKOTE, Inc
INK USAGE FOR 1991

01-Jan-91 : DATE

Press:example WHI 36"

VARNISHES	NUMBER	01-Jan DAILY USAGE (POUNDS)	SOLVENT CONTENT (POUNDS)	PERCENT SOLVENT
CRYSTAPHANE NB-1061	PO1CC201	2,200.0	893.2	40.6%
NB-1061 MIX	1061-MIX		0.0	41.4%
NB-1061 MIX WORKOFF	1061-WORK		0.0	50.0%
OVP VARNISH KJ-902	K902		0.0	69.7%
KJ-902 WORKOFF	K902-WORK		0.0	80.0%
VARNISH	K-2072		0.0	50.8%
PROMONT EXTENDER	W42981		0.0	54.3%
CATALYST 51-53	W52CC004	220.0	110.0	50.0%
WAX	K673	22.0	9.4	42.8%
SILCONE SLIP	RW0145		0.0	
CONVERTERS SLIP	GV-6340		0.0	
VINYL EXTENDER	RV-0170		0.0	
PLASTICIZER	RA0351		0.0	
PROMONT CLAY EXTENDER	W1106		0.0	33.0%
S&V WATER BASE OVERLACQUR	ATC 69798		0.0	
S&V BISCUIT VARNISH	JSC11352		0.0	74.5%
S&V BISC VARNISH WORKOFF	S&V-WORK		0.0	85.0%
PROMONT FLATTENING AGENT	PE1267		0.0	
PROMONT VARNISH	K828		0.0	72.0%
PROMONT WAX	884		0.0	
PROMONT WAX FLEXO SLIP	K827		0.0	64.2%
EXTRA	EXTRA		0.0	
EXTRA	EXTRA		0.0	
EXTRA	EXTRA		0.0	
EXTRA	EXTRA		0.0	
EXTRA	EXTRA		0.0	
EXTRA	EXTRA		0.0	
TOTAL VARNISH USAGE (POUNDS)		2,442.0	1,012.6	

VARNISH DECK SOLVENTS	Number	DAILY USAGE (GALLONS)	SOLVENT CONTENT (POUNDS)	POUNDS PER GALLON
NP Alcohol		26.0	173.4	6.67
NP Acetate		6.0	44.2	7.37
Denatured Ethyl Alcohol			0.0	6.61
Ethyl Acetate			0.0	7.47
Glycol Ether EP (Cello)			0.0	7.53
Blended NP Alcohol 90/10 Acetate			0.0	6.73
Blended NP Alcohol 80/20 Acetate			0.0	6.81
TOTAL VARNISH DECK SOLVENTS		32.0	217.6	
HAZARDOUS WASTE VARNISH DECK			0.0	7.00

INKS	NUMBER	DAILY USAGE (POUNDS)	SOLVENT CONTENT (POUNDS)	PERCENT SOLVENT
WORKOFF INK	WORKOFF	452.0	316.4	70.0%
FLEXOGEM OP WHITE	CR38100		0.0	38.8%
FLEXOGEM-B G/S YELLOW	85CR5578	18.0	11.5	64.0%
FLEXOGEM-B R/S YELLOW	85CR5579		0.0	68.1%
FLEXOGEM-B G/S CYAN BLUE	85CR5580		0.0	63.6%
FLEXOGEM-B B/S RUBINE	85CR5584	18.0	11.1	61.8%
FLEXOGEM-B R/S CYAN BLUE	85CR5581		0.0	66.3%
FLEXO EXTENDER	CR36678		0.0	52.7%
FLEXOGEM-B CYAN GREEN	85CR5577	505.0	331.8	65.7%
FLEXOGEM-B Y/S WATCHUNG	85CR5585		0.0	52.2%
FLEXOGEM-B BLACK	86CR5246	31.0	20.6	66.4%
FLEXOGEM-B Y/S RHODAMINE	85CR5587		0.0	66.7%
FLEXOGEM-B B/S RHODAMINE	85CR5588		0.0	67.9%
FLEXOGEM-B METHYL VIOLET	85CR5583		0.0	64.8%
BB FLUORESCENT GREEN	F1699		0.0	
FLEXO WHITE	86ES1055		0.0	
TRANS FLEXOGEM-B YELLOW	88CR5372		0.0	64.7%
FLEXO Y/S NAPTHOL	87CR5094		0.0	
G/S YELLOW BASE	V1256		0.0	69.0%
R/S YELLOW BASE	V1257		0.0	76.2%
Y/S WATCHUNG BASE	T1434		0.0	69.8%
RUBINE BASE	T1490		0.0	62.1%
CYAN BLUE BASE	R1379		0.0	66.1%
FLEXO GREEN	802		0.0	
FLEXO RED	802		0.0	
FLEXO REFLEX BLUE	87CR5356		0.0	
RUBINE MIX	RUBN-MIX		0.0	60.6%
CYAN GREEN BASE	S1119		0.0	67.8%
EXTRA	EXTRA		0.0	
EXTRA	EXTRA		0.0	
EXTRA	EXTRA		0.0	
MEGA RUBINE	T52490		0.0	75.9%
MEGA CYAN GREEN	2119		0.0	
MEGA G/S YELLOW	52256		0.0	73.8%
MEGA Y/S WATCHUNG	52438		0.0	
MEGA BLACK	P1070		0.0	67.1%
MEGA R/S YELLOW	319		0.0	
MEGA WHITE	52104		0.0	40.5%
MEGA G/S CYAN BLUE	R52379		0.0	76.1%
MEGA MBOND BLACK	P52070		0.0	71.6%
MEGA WAX	349		0.0	
MEGA OPT EXTENDER			0.0	
MEGA EXTENDER	2103		0.0	
MEGA Y/S WATCHUNG	T52434		0.0	
MEGA BLACK	P52070		0.0	
MEGA G/S YELLOW	V52256		0.0	
MEGA CYAN BLUE	R52379		0.0	
MEGA T WHITE	W52103		0.0	
MEGA R/S YELLOW	V52319		0.0	

MEGA REFLEX BLUE	90CR5721	0.0	
MEGA SILVER	90CR5722	0.0	
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
PROMONT RUBINE	T42490	0.0	56.9%
PROMONT G/S PROCESS BLUE	R42379	0.0	57.3%
PROMONT G/S YELLOW	V42256	0.0	61.7%
PROMONT BLACK	P42090	0.0	59.4%
PROMONT OP WHITE	F92242	0.0	22.6%
PROMONT RED LAKE C	T42438	0.0	70.0%
PROMONT R/S YELLOW	V1257	0.0	76.2%
PROMONT Y/S RHODAMINE	87CR5004	0.0	59.6%
PROMONT B/S WATCHUNG	T42433	0.0	59.1%
PROMONT METHYL VIOLET	R42343	0.0	52.6%
PROMONT CYAN GREEN	S42119	0.0	52.6%
ADHESION PROMOTER/FOAM	K20006	0.0	
PROMONT EXTENDER	W42981	0.0	54.3%
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
MULTIBOND BLACK	1308	0.0	65.7%
MULTIBOND DARK BLUE	88A1280	0.0	
MULTIBOND LIGHT BLUE	88A1279	0.0	
MULTIBOND OP WHITE	W1103	0.0	33.0%
MULTIBOND XMAS GREEN	88CR5133	0.0	65.6%
MULTIBOND XMAS CREAM		0.0	
MULTIBOND EXTENDER	88A1304	0.0	66.3%
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
PLIOLOX BLACK		0.0	
PLIOLOX RUBINE		0.0	
PLIOLOX BLUE		0.0	
PLIOLOX G/S YELLOW		0.0	
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
POLYAMIDE SILVER	88A1281	0.0	50.5%
SILVER	PZ2007	0.0	
GOLD	PZ0243	0.0	
COPPER	PZ0245	0.0	
YELLOW BASE	V19256	0.0	70.2%
SYLOID POWDER	308	0.0	
CALCO FLOUR POWDER	DS1006	0.0	
DYNABOND EXTENDER	93947	0.0	75.8%

DYNABOND VEHICLE	94038	0.0	66.6%
POLYGEM SILVER	89A1437	0.0	
POLYGEM WHITE	1436	0.0	
MAS MAGENTA/TRIAL	CR32989	0.0	
BLACK HR 375/EXXON TRIAL	87CR5078	0.0	
BLUE HR 375/TRIAL	87CR5071	0.0	
MADRAS ORANGE	V1230	0.0	
TRIAL RUBINE BASE	CR38332	0.0	
AARBERG INK 97-1 MAGENTA	KRX 6247	0.0	
AARBERG INK 97-1 G/S BLUE	KBX 6171	0.0	
AARBERG INK 91-1 EXTENDER	KJC 6163	0.0	
AARBERG INK- CURE COAT	KJX 6435	0.0	
AARBERG INK- CATALYST	KJX 1012	0.0	
AARBERG INK- WAX COMPOUND	KJE6348-0	0.0	
S&V BISCUIT WHITE FOIL	JSC10886	0.0	
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
EXTRA	EXTRA	0.0	
TOTAL PRINTING DECK INK USAGE	1,024.0	691.4	

PRINTING DECK SOLVENTS	Number	DAILY USAGE (GALLONS)	SOLVENT CONTENT (POUNDS)	POUNDS PER GALLON
NP Alcohol		49.0	326.8	6.67
NP Acetate		5.0	36.9	7.37
Denatured Ethyl Alcohol			0.0	6.61
Ethyl Acetate			0.0	7.47
Glycol Ether EP (Cello)		7.0	52.7	7.53
Blended NP Alcohol 90/10 Acetate			0.0	6.73
Blended NP Alcohol 80/20 Acetate			0.0	6.81
TOTAL INK SOLVENTS		61.0	416.4	
HAZARDOUS WASTE PRINTING DECK		5.0	35.0	7.00

PRESS CLEANUP SOLVENTS ITEM	Number	DAILY USAGE (GALLONS)	SOLVENT CONTENT (POUNDS)	POUNDS PER GALLON
NP Alcohol		10.0	66.7	6.67
NP Acetate			0.0	7.37
Denatured Ethyl Alcohol			0.0	6.61
Ethyl Acetate			0.0	7.47
Glycol Ether EP (Cello)			0.0	7.53
Blended NP Alcohol 90/10 Acetate			0.0	6.73
Blended NP Alcohol 80/20 Acetate			0.0	6.81
Cleanup solvent inventory change			0.0	7.00
TOTAL CLEANUP SOLVENTS		10.0	66.7	
HAZARDOUS WASTE CLEANUP		3.0	21.0	7.00

	HOURS
PRESS MANNED HOURS	24.0
PRESS RUN HOURS	16.0
PRESS MAKEREADY HOURS	8.0

	REAMS
TOTAL REAMS (432,000 SQ INCHES PER REAM)	542.5
POUNDS OF SOLVENT INPUT/REAM	4.3

PRODUCED SQUARE INCHES DESCRIPTION	JOB #	WIDTH (INCHES)	INPUT FEET	MILLION SQ INCHES
ORANGE JUICE LABELS		29.060	672000	234.3
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
TOTAL			672000	234.3
TOTAL REAMS				542.5

DAILY SUMMARY 01-Jan
Press:example WHI 36"

SOLVENT INPUT SUMMARY

INK DECK INPUT

solvent content of ink	691.4
plus solvent used to dilute ink	416.4
gross solvent input to ink deck	1,107.8
less hazardous waste from ink deck	(35.0)
NET SOLVENT INPUT TO INK DECK	1,072.8

VARNISH DECK INPUT

solvent content of varnish	1,012.6
plus solvent used to dilute varnish	217.6
gross solvent input to varnish deck	1,230.3
less hazardous waste from varnish deck	0.0
NET SOLVENT INPUT TO VARNISH DECK	1,230.3

CLEANUP INPUT

solvent input to cleanup	66.7
less hazardous waste from cleanup	21.0
NET SOLVENT INPUT TO CLEANUP	45.7

EMISSIONS CONTRIBUTING TO ANNUAL TONNAGE

net solvent input to ink deck	1,072.8
net solvent input to varnish deck	1,230.3
COMBINED SOLVENT INPUT PRESS	2,303.1
annual test capture target=70% ACTUAL>	74.0%
annual test destruction target=95% ACTUAL>	91.0%
overall control=capture X destruction) minimum 66.5% actual>	67.3%
PRESS EMISSIONS=(input X 1-overall control %)	752
net solvent input from cleanup	45.7
capture	0.0%
destruction	0.0%
overall control	0.0%
CLEANUP EMISSIONS=input X 1-overall control %	45.7
press emissions	752.2
cleanup emissions	45.7
total daily emissions	797.9
DAILY EMISSIONS TONS=(press #+cleanup #)/2000 contributing to annual tonnage	0.399

RUN HOUR EMISSIONS RATES

net solvent input to ink deck	1,072.8
makeready hours	8.0
run hours	16.0
solvent input during mr hrs=mr hrs x 6#/hr	(48.0)
solvent input to ink deck during run hours	1,024.8
SOLVENT INPUT/RUN HOUR	64.1
overall control	67.3%
emissions during run=input x(1-overall control %)	334.7
INK DECK EMISSIONS PER RUN HOUR	20.9
net solvent input to varnish deck	1,230.3
makeready hours	8.0
run hours	16.0
solvent input during mr hrs= mr hrs x 1#/hr	(8.0)
net solvent input to varnish deck during run hrs	1,222.3
SOLVENT INPUT/RUN HOUR	76.4
overall control %	67.3%
emissions during run=input x 1-overall control %	399.2
VARNISH DECK EMISSIONS PER RUN HOUR	24.9
NET SOLVENT INPUT FROM CLEANUP	45.7
manned hours	24.0
input/hr=cleaning solvent input/manned hrs	1.9
overall control %	0.0%
emissions from cleanup=input*1-overall control %	45.7
CLEANUP EMISSION/MANNED HOUR	1.9

HOURLY INPUT RATE SUMMARY

ink deck	64.1
varnish deck	76.4
cleanup	1.9
TOTAL INPUT PER RUN HOUR	142.3

HOURLY EMISSION RATE SUMMARY

ink deck	20.9
varnish deck	24.9
cleanup	1.9
TOTAL EMISSIONS PER RUN HOUR	47.8

Note that each of 6 decks on the CI drum input 1#/hr of solvent per hour for a total of 6#/hr input and 2.4#/hr emissions during makeready hours.
The varnish deck also inputs 1#/hour of solvent and .4# of emissions per hour during makeready.
Therefore the makeready hour inputs are 6+1=7#/hr
and the makeready hour emissions are 2.4+.4=2.8#/hour
These makeready inputs do not contribute to run hour emissions.
These makeready inputs ARE CALCULATED in the daily and annual input and emissions on the previous page.

fp SPIRALKOTE, INC.
1200 CENTRAL FLORIDA PKWY.
ORLANDO, FLA. 32821

Commercial National Bank
OF PEORIA
Member Midwest Financial Group, Inc.
PEORIA, ILLINOIS 61631

8190
70-4/711

PAY Two hundred and 00/100

TO THE ORDER OF	DATE	AMOUNT
Florida Department of Environmental Regulations	January 25, 1991	$*200.00*

[redacted]

Florida Dept. of
Environmental Regulation
Twin Towers Office Bldg.
2600 Blairstone Road
Tallahassee, FL 32399-2400

Re: 36" WH-I 6 COLOR 746 CC PRESS WITH TWO DOWNSTREAM FLEXOGRAVURE COATER PERMIT A048-137831

Dear Mr. Fancy:

Please reissue our permit as described below to reflect actual maximum operating conditions instead of "average conditions" which were the basis of the original permits.

An explanation of the reasons for each of the changes requested is explained on the attached "Appendix Sheets".

No change in annual tons emitted will occur.

(page 4 of 7 Specific Conditions)

Specific Condition 5:

From: The hours of operation shall not exceed 520 per month and 6240 annually.

To: This source is permitted to operate 8760 hours per year.

Specific Condition 6:

From: The maximum rated production capacity is 26 reams per hour based on 3000 square feet per ream.

To: The maximum input to the press is 180 pounds of VOC per "run hour" calculated on a daily basis.

PM: CM:P 448-574-924
12-7-90
Orlando, FL

File Cy

SINCE 1934

fp Spiralkote, Inc.
A Subsidiary Of Fleming Packaging Corporation

RECEIVED
DEC 10 1990
DER - BAQM

December 7, 1990

Mr. Clair Fancy, P.E.
Bureau Chief, Air Regulation
Division of Air Resources Mgmt.
Florida Dept. of
Environmental Regulation
Twin Towers Office Bldg.
2600 Blairstone Road
Tallahassee, FL 32399-2400

Re: 36" WH-I 6 COLOR 746 CC PRESS WITH TWO DOWNSTREAM FLEXO GRAVURE COATER

PERMIT A048-137831

Dear Mr. Fancy:

Please amend our permit as described below to reflect actual maximum operating conditions instead of "average conditions" which were the basis of the original permits.

An explanation of the reasons for each of the changes requested is explained on the attached "Appendix Sheets".

No change in annual tons emitted will occur.

(page 4 of 7 Specific Conditions)

Item 5. From: The hours of operation shall not exceed 520 per month and 6240 annually.

To: This source is permitted to operate 8760 hours per year.

Item 6. From: The maximum rated production capacity is 26 reams per hour based on 3000 square feet per ream.

To: The maximum input to the press is 180 pounds of VOC per "run hour".

1200 CENTRAL FLORIDA PARKWAY ORLANDO, FLORIDA 32821-9295 TELEPHONE (407) 859-7780 FAX: (407) 857-0430

Item 7. From: Emission of volatile organic compounds and organic solvents shall not exceed 22.8 pounds per hour, 5.9 tons per month, and 71.3 tons per year, based on a minimum of 70% capture efficiency and a 95% destruction efficiency (oxidizes at least 95% of the VOC measured as total combustible carbon, to carbon dioxide and water) and includes 1 ton per year of clean up - solvent.

To: Emissions shall not exceed 71.3 tons per year or 60# per "run hour". The overall (capture and destruction) destruction efficiency shall be shall be 66.5% of VOC input to the press including cleanup solvent less waste solvent shipped as hazardous waste. Typical capture efficiency will be 70 to 85% (target 70%) and typical destruction of captured VOC (oxidizes captured VOC measured as total combustible carbon to carbon dioxide and water) will be between 80 and 98%. (Target 95%) The 12 month rolling cummulative total VOC emissions from the press will not exceed 71.3 tons.

If you have any qeustions on this matter please don't hesitate to call me at (407) 859-7780.

Sincerely,

fp SPIRALKOTE, INC.

Edward Jr

ED WARD, JR
EXECUTIVE VICE PRESIDENT PRODUCTION

jac

cc: John Turner, Dennis Nester, Stephen Neck, Bruno Ferraro, Jerome Guidry, J.R. Wilson, Chris Johns

APPENDIX I

EXPLANATIONS

Item 5. Change operating hours from 6248 to 8760

Purpose of Change:

To inform the Florida DER that some weeks and months we have to run 6-7 days a week to meet the seasonal demands of Christmas and the orange juice harvest season.

The actual emission hours at run speeds will be 2200 to 4000 hours per year depending on the mixture of labels being produced.

The typical year, (8760 hours) running citrus labels, will consist of:

2560 unmanned hours (29%) of no input on weekends and holidays
6200 manned hours (71%) of which:
- 3700 hours (42%) are makeready, maintenance and cleanup with 7#/hour of solvent input. (5 tons emissions)
- 2500 hours (29%) are run hours with 100# to 180#/hr solvent input. (50 to 89 tons emissions)

The typical day will consist of:

HOURS

6 makeready for orange juice label
2 run at 500 - 800 fpm
1 clean printing plates to eliminate fuzzy printing

6 makeready for grapefruit juice label
7 run at 500 - 800 fpm
2 maintenance and reweb the press because of paper break

---

24 Manned hours with 9 run hours (38%)

APPENDIX II

Item 6. Change maximum production from 26 reams per hour to 180# of solvent input per hour.

Purpose of Change:

To provide the Florida DER and Spiralkote with a measurable quantity, available on a daily basis, by which potential emissions can be predicted.

Reams per hour is a very poor predictor of solvent input because the pounds of solvent input per ream varies dramatically from one grade to another.

For example:

GRADE	POUNDS OF SOLVENT PER YEAR
Polyethylene bread wrap	2 or less
Orange juice paper labels	3 to 4
Christmas gift wrap	5 to 7
Refrigerated biscuit labels	7 to 9

The 180#/ per hour input solvent load would allow Spiralkote to run 930 fpm on standard 29.06" wide orange juice paper at 4# per ream solvent input which is 33% faster than the typical job. 930 fpm represents the maximum speed at which we can dry and cure our inks and coatings under the best of conditions.

The 180#/per hour solvent input assumes applying approximately 90# of solvent to:

A. the central impression printing decks with its associated 120#/per hr incinerator.

B. and the flexogravure deck I and its associated 120#/per hr incinerator or the flexogravure deck II and its associated 120#/per hr incinerator.

Daily records similar to Appendix IV will be used to verify Compliance. (see attachment)

APPENDIX III

Item 7. A. change from 22.8# of emissions per hour to 60#/per hr.

Purpose of Change: To adjust the permit reflect actual maximum emissions during actual maximum input conditions of 180#/run hour. Annual tests should occur at this level, not the average level.

The 22.8#/per hr emission rate is an average condition.It is based on 209.0 tons of annual in-put which are overall destructed at a rate of 66.5% to yield 70.3 ton emissions plus 1.0 tons of clean up solvent. 71.3 tons x 2000 #/ton/6240 permitted hours = 22.8# emissions per average hour every manned hour of the year.

The press does not operate every manned hour. Typically it only operates 35-64% of the manned hours and only 25-45% of the 8760 total hours per year.

B. Change from 70% capture and 95% destruction to 66.5% overall destruction of solvent input.

Purpose of Change: To acknowledge that capture can be improved while destruction with catalytic systems is 95% only with new charges of catalyst. The catalyst constantly degrades from the point onward. This change will provide the incentive to increase capture and lower operating costs by extending useful catalyst life.

C. Change from 5.9 tons/month emissions to: The 12 month rolling cumulative total emissions shall not exceed 71.3 tons.

Purpose of Change: To reflect the fact that business has peak seasons, lasting several months, which may be 2 or 2.5 times the average monthly emissions. Christmas and the orange juice harvest season are the usual causes of these peaks.

APPENDIX IV

fp SPIRALKOTE, Inc
INK USAGE FOR 1990
05-Dec-90 :
Press: W & H I

DAILY INPUT SUMMARY

	(POUNDS)
TOTAL INK SOLVENT AND CLEANUP SOLVENT INPUT	319.2
LESS:	
HAZARDOUS WASTE DISPOSED	29.8
NET INK SOLVENT AND CLEANUP SOLVENT INPUT	289.4
NET VARNISH SOLVENT INPUT	413.9
TOTAL SOLVENT INPUT	703.4
NET INK AND CLEANUP SOLVENT DAILY INPUT	289.4
INK AND CLEANUP EMISSIONS PER DAY	97.0
INK AND CLEANUP SOLVENT INPUT PER HOUR	65.8
INK AND CLEANUP EMISSIONS PER HOUR	22.0
NET VARNISH SOLVENT DAILY INPUT	413.9
VARNISH EMISSIONS PER DAY	138.7
VARNISH SOLVENT INPUT PER HOUR	94.1
VARNISH EMISSIONS PER HOUR	31.5
TOTAL SOLVENT DAILY INPUT	703.4
TOTAL EMISSIONS PER DAY	235.6
TOTAL SOLVENT INPUT PER HOUR	159.9
TOTAL EMISSIONS PER HOUR	53.6

	DAILY
PRESS RUN HOURS	4.4

fp SPIRALKOTE, Inc
INK USAGE FOR 1990

05-Dec-90 : DATE

Press: W & H I

ITEM	NUMBER	05-Dec DAILY USAGE (POUNDS)	SOLVENT CONTENT (POUNDS)	PERCENT SOLVENT
CRYSTAPHANE NB-1061	PO1CC201	0.0	0.0	40.6%
NB-1061 MIX	1061-MIX	300.0	124.2	41.4%
NB-1061 MIX WORKOFF	1061-WORK	90.0	45.0	50.0%
OVP VARNISH KJ-902	K902	0.0	0.0	69.7%
KJ-902 WORKOFF	K902-WORK	0.0	0.0	80.0%
VARNISH	K-2072	0.0	0.0	50.8%
PROMONT EXTENDER	W42981	0.0	0.0	54.3%
CATALYST 51-53	W52CC004	0.0	0.0	50.0%
WAX	K673	0.0	0.0	42.8%
SILCONE SLIP	RW0145	0.0	0.0	
CONVERTERS SLIP	GV-6340	0.0	0.0	
VINYL EXTENDER	RV-0170	0.0	0.0	
PLASTICIZER	RA0351	0.0	0.0	
PROMONT CLAY EXTENDER	W1106	0.0	0.0	33.0%
S&V WATER BASE OVERLACQUR	ATC 69798	0.0	0.0	
S&V BISCUIT VARNISH	JSC11352	100.0	74.5	74.5%
S&V BISC VARNISH WORKOFF	S&V-WORK	(180.0)	(153.0)	85.0%
PROMONT FLATTENING AGENT	PE1267	0.0	0.0	
PROMONT VARNISH	K828	0.0	0.0	72.0%
PROMONT WAX	884	0.0	0.0	
PROMONT WAX FLEXO SLIP	K827	0.0	0.0	64.2%
CZ THERMO OVERLACQUER	LXI 21421	0.0	0.0	
VARNISH	K655	0.0	0.0	
TOP LACQUER/COKE TRIAL	K2117	0.0	0.0	
OVERPRINT VARNISH (film)	90A184	0.0	0.0	
BAG VARNISH WATER BASE	38117	0.0	0.0	
BAG LACQUER	90A297	0.0	0.0	
GPI OP VARNISH (SUN CHEM)	P86-1864	0.0	0.0	
CITRUS OVERLACQUER 20225K	9KK62B	0.0	0.0	
CATALYST (TECH COAT)	20251B	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
TOTAL VARNISH USAGE		310.0	90.7	

ITEM	NUMBER	DAILY USAGE (POUNDS)	SOLVENT CONTENT (POUNDS)	PERCENT SOLVENT
WORKOFF INK	WORKOFF	(108.0)	(75.6)	70.0%
FLEXOGEM OP WHITE	CR38100	80.0	31.0	38.8%

fp SPIRALKOTE, Inc
INK USAGE FOR 1990

05-Dec-90 : DATE

Press: W & H I

ITEM	NUMBER	05-Dec DAILY USAGE (POUNDS)	SOLVENT CONTENT (POUNDS)	PERCENT SOLVENT
FLEXOGEM-B G/S YELLOW	85CR5578	70.8	45.3	64.0%
FLEXOGEM-B R/S YELLOW	85CR5579	0.0	0.0	68.1%
FLEXOGEM-B G/S CYAN BLUE	85CR5580	0.0	0.0	63.6%
FLEXOGEM-B B/S RUBINE	85CR5584	30.0	18.5	61.8%
FLEXOGEM-B R/S CYAN BLUE	85CR5581	0.0	0.0	66.3%
FLEXO EXTENDER	CR36678	66.5	35.0	52.7%
FLEXOGEM-B CYAN GREEN	85CR5577	0.0	0.0	65.7%
FLEXOGEM-B Y/S WATCHUNG	85CR5585	0.0	0.0	52.2%
FLEXOGEM-B BLACK	86CR5246	0.0	0.0	66.4%
FLEXOGEM-B Y/S RHODAMINE	85CR5587	0.0	0.0	66.7%
FLEXOGEM-B B/S RHODAMINE	85CR5588	0.0	0.0	67.9%
FLEXOGEM-B METHYL VIOLET	85CR5583	0.5	0.3	64.8%
BB FLUORESCENT GREEN	F1699	0.0	0.0	
FLEXO WHITE	86ES1055	0.0	0.0	
TRANS FLEXOGEM-B YELLOW	88CR5372	0.0	0.0	64.7%
FLEXO Y/S NAPTHOL	87CR5094	16.3	10.2	62.6%
G/S YELLOW BASE	V1256	0.0	0.0	69.0%
R/S YELLOW BASE	V1257	0.0	0.0	76.2%
Y/S WATCHUNG BASE	T1434	0.0	0.0	69.8%
RUBINE BASE	T1490	0.0	0.0	62.1%
CYAN BLUE BASE	R1379	0.0	0.0	66.1%
FLEXO GREEN	802	0.0	0.0	
FLEXO RED	802	0.0	0.0	
FLEXO REFLEX BLUE	87CR5356	0.0	0.0	
RUBINE MIX	RUBN-MIX	0.0	0.0	60.6%
FLEXOTUF BRONZE/ GOLD	87A239	0.0	0.0	34.4%
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
MEGA RUBINE	T52490	0.0	0.0	75.9%
MEGA CYAN GREEN	2119	0.0	0.0	
MEGA G/S YELLOW	52256	0.0	0.0	73.8%
MEGA Y/S WATCHUNG	52438	0.0	0.0	
MEGA BLACK	P1070	0.0	0.0	67.1%
MEGA R/S YELLOW	319	0.0	0.0	
MEGA WHITE	52104	0.0	0.0	40.5%
MEGA G/S CYAN BLUE	R52379	0.0	0.0	76.1%
MEGA MBOND BLACK	P52070	0.0	0.0	71.6%
MEGA WAX	349	0.0	0.0	
MEGA OPT EXTENDER		0.0	0.0	
MEGA EXTENDER	2103	0.0	0.0	
MEGA Y/S WATCHUNG	T52434	0.0	0.0	
MEGA BLACK	P52070	0.0	0.0	
MEGA G/S YELLOW	V52256	0.0	0.0	
MEGA CYAN BLUE	R52379	0.0	0.0	
MEGA T WHITE	W52103	0.0	0.0	
MEGA R/S YELLOW	V52319	0.0	0.0	

fp SPIRALKOTE, Inc
INK USAGE FOR 1990

05-Dec-90 : DATE

Press: W & H I

ITEM	NUMBER	05-Dec DAILY USAGE (POUNDS)	SOLVENT CONTENT (POUNDS)	PERCENT SOLVENT
MEGA REFLEX BLUE	90CR5721	0.0	0.0	
MEGA SILVER	90CR5722	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
PROMONT RUBINE	T42490	0.0	0.0	56.9%
PROMONT G/S PROCESS BLUE	R42379	0.0	0.0	57.3%
PROMONT G/S YELLOW	V42256	3.0	1.9	61.7%
PROMONT BLACK	P42090	0.0	0.0	59.4%
PROMONT OP WHITE	F92242	0.0	0.0	22.6%
PROMONT RED LAKE C	T42438	12.0	8.4	70.0%
PROMONT R/S YELLOW	V1257	0.0	0.0	76.2%
PROMONT Y/S RHODAMINE	87CR5004	0.0	0.0	59.6%
PROMONT B/S WATCHUNG	T42433	0.0	0.0	59.1%
PROMONT METHYL VIOLET	R42343	0.0	0.0	52.6%
PROMONT CYAN GREEN	S42119	0.0	0.0	52.6%
ADHESION PROMOTER/FOAM	K20006	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
MULTIBOND BLACK	1308	0.0	0.0	65.7%
MULTIBOND DARK BLUE	88A1280	0.0	0.0	
MULTIBOND LIGHT BLUE	88A1279	0.0	0.0	
MULTIBOND OP WHITE	W1103	0.0	0.0	33.0%
MULTIBOND XMAS GREEN	88CR5133	0.0	0.0	65.6%
MULTIBOND XMAS CREAM		0.0	0.0	
MULTIBOND EXTENDER	88A1304	0.0	0.0	66.3%
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
PLIOLOX BLACK		0.0	0.0	
PLIOLOX RUBINE		0.0	0.0	
PLIOLOX BLUE		0.0	0.0	
PLIOLOX G/S YELLOW		0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
POLYAMIDE SILVER	88A1281	0.0	0.0	50.5%
SILVER	PZ2007	0.0	0.0	

fp SPIRALKOTE, Inc
INK USAGE FOR 1990

05-Dec-90 : DATE

Press: W & H I

ITEM	NUMBER	05-Dec DAILY USAGE (POUNDS)	SOLVENT CONTENT (POUNDS)	PERCENT SOLVENT
GOLD	PZ0243	0.0	0.0	
COPPER	PZ0245	0.0	0.0	
YELLOW BASE	V19256	0.0	0.0	70.2%
SYLOID POWDER	308	0.0	0.0	
CALCO FLOUR POWDER	DS1006	0.0	0.0	
DYNABOND EXTENDER	93947	0.0	0.0	75.8%
DYNABOND VEHICLE	94038	0.0	0.0	66.6%
POLYGEM SILVER	89A1437	0.0	0.0	
POLYGEM WHITE	1436	0.0	0.0	
MAS MAGENTA/TRIAL	CR32989	0.0	0.0	
BLACK HR 375/EXXON TRIAL	87CR5078	0.0	0.0	
BLUE HR 375/TRIAL	87CR5071	0.0	0.0	
MADRAS ORANGE	V1230	0.0	0.0	
TRIAL RUBINE BASE	CR38332	0.0	0.0	
AARBERG INK 97-1 MAGENTA	KRX 6247	0.0	0.0	
AARBERG INK 97-1 G/S BLUE	KBX 6171	0.0	0.0	
AARBERG INK 91-1 EXTENDER	KJC 6163	0.0	0.0	
AARBERG INK- CURE COAT	KJX 6435	0.0	0.0	
AARBERG INK- CATALYST	KJX 1012	0.0	0.0	
AARBERG INK- WAX COMPOUND	KJE6348-0	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
EXTRA	EXTRA	0.0	0.0	
TOTAL INK USAGE		171.0	75.1	

VARNISH SOLVENTS USED

ITEM	Number	DAILY USAGE (GALLONS)	SOLVENT CONTENT (POUNDS)	POUNDS PER GALLON
NP Alcohol		4.5	30.0	6.67
NP Acetate		0.0	0.0	7.37
Denatured Ethyl Alcohol		0.0	0.0	6.61
Ethyl Acetate		0.0	0.0	7.47
Glycol Ether EP (Cello)		0.0	0.0	7.53
Blended NP Alcohol		43.5	293.2	6.74
TOTAL VARNISH SOLVENTS		48.0	323.2	

fp SPIRALKOTE, Inc
INK USAGE FOR 1990
05-Dec-90
Press: W & H I

INK SOLVENTS USED ITEM	Number	DAILY USAGE (GALLONS)	SOLVENT CONTENT (POUNDS)	POUNDS PER GALLON
NP Alcohol		9.0	60.0	6.67
NP Acetate		2.5	18.4	7.37
Denatured Ethyl Alcohol		0.0	0.0	6.61
Ethyl Acetate		1.0	7.5	7.47
Glycol Ether EP (Cello)		0.0	0.0	7.53
Blended NP Alcohol		13.5	91.0	6.74
TOTAL INK SOLVENTS		26.0	176.9	

PRESS CLEANUP SOLVENTS ITEM	Number	DAILY USAGE (GALLONS)	SOLVENT CONTENT (POUNDS)	POUNDS PER GALLON
NP Alcohol		0.0	0.0	6.67
NP Acetate		0.0	0.0	7.37
Denatured Ethyl Alcohol		0.0	0.0	6.61
Ethyl Acetate		9.0	67.2	7.47
Glycol Ether EP (Cello)		0.0	0.0	7.53
Blended NP Alcohol		0.0	0.0	6.74
TOTAL CLEANUP SOLVENTS		9.0	67.2	

	(GALLONS)	(POUNDS)	PERCENT SOLVENT
DAILY HAZARDOUS WASTE DISPOSED	5.0	29.8	85.0%

	DAILY
PRESS RUN HOURS	4.4

SINCE 1934

fp Spiralkote, Inc.

A Subsidiary Of Fleming Packaging Corporation

October 15, 1990

RECEIVED

OCT 18 1990

DER - BAQM

Mr. Bruce Mitchell
Air Permitting Engineer
Florida DER
Twin Towers Building
2600 Blairstone Road
Tallahassee, FL 32399-2400

Dear Mr. Mitchell:

Confirming our discussions of September 24, 1990, as a new manager of fp Spiralkote, Inc with a goal of achieving compliance now and in the future I wish to:

1. amend our existing permits so that they better reflect actual running conditions instead of "average conditions".

2. add a second incinerator to the Kidder C-I press to extend catalyst life and improve capture.

3. request an increase in the permitted emissions of the Kidder C-I press Permit #(A048-146002) by 35 annual tons. A modification permit application will be sent soon.

4. utilize the infrequently used 3rd incinerator on the 36" WH-I 746CC. Permit #(A048-137831) to control the emissions of the coater deck of the 52" WH-II 746ST. Permit #(AC48-157290)

We have explained our approach to correcting our problems to John Turner of the Central District and Dennis Nester of Orange County. They support our efforts to improve capture on the Kidder; correct our permits; and conduct full load compliance tests after these changes have been made.

Enclosed are letters addressing items 2 and 4.

Sincerely,

Ed Ward

ED WARD
Vice President Production

jac

encl.
cc: John Turner, Dennis Nester, Stephen Neck, Bruno Ferraro, Jerome Guidry, J.R. Wilson, Chris Johns

1200 CENTRAL FLORIDA PARKWAY ORLANDO, FLORIDA 32821-9295 TELEPHONE (407) 859-7780 FAX. (407) 857-0430

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Air Permitting Engineer
Division of Air Resources Management
Florida DER
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2600 Blairstone Road
Tallahassee, FL 32399-2400
904 488-1344

John Turner
Air Permitting Engineer
Florida DER - Central District
3319 Maquire Road
Suite 232
Orlando, FL 32803
407 894-7555

Clair Fancy P.E.
Bureau Chief, Air Regulation
Division of Air
Resources Management,
Florida DER
Twin Towers Building
2600 Blairstone Road
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Dennis Nester
Orange County EPA
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Orlando, FL 32806-4999
407 244-7400

Ed Ward, Jr.
fp Spiralkote, Inc.
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Gainesville, FL 32606
904 335-1889

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Orlando, FL 32807
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Suite F
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407 290-9038 Fax

Alan Zahm P.E.
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Central District
3319 Maquire Rd.
Suite 232
Orlando, FL
407 894-7555

SINCE 1934

fp Spiralkote, Inc.

A Subsidiary Of Fleming Packaging Corporation

October 15, 1990

Mr. Clair Fancy, P.E.
Bureau Chief, Air Regulation
Division of Air
Resources Management,
Florida Department of
Environmental Regulation
Twin Towers Office Bldg
2600 Blairstone Road
Tallahassee, FL 32399-2400

Dear Mr. Fancy:

Re: 52" WH-II 746 ST 6 COLOR PRESS WITH ONE DOWNSTREAM FLEXO COATER - PERMIT #AC48-157290

Please insert the attached drawings to our construction permit. These drawings show the exact locations of our incinerators. We are directing the coater station Voc load to the existing 4000 CFM incinerator on the flexogravure II deck of the 36" WH-I press. Permit # (A048-137831)

The incinerator on the flexogravure II deck has only been used 2% of the time since its installation in 1986. We will use one source at a time at this incinerator.

There will be no increase in emissions due to this change.

If you have any questions on this matter please call.

Sincerely,

Ed Ward

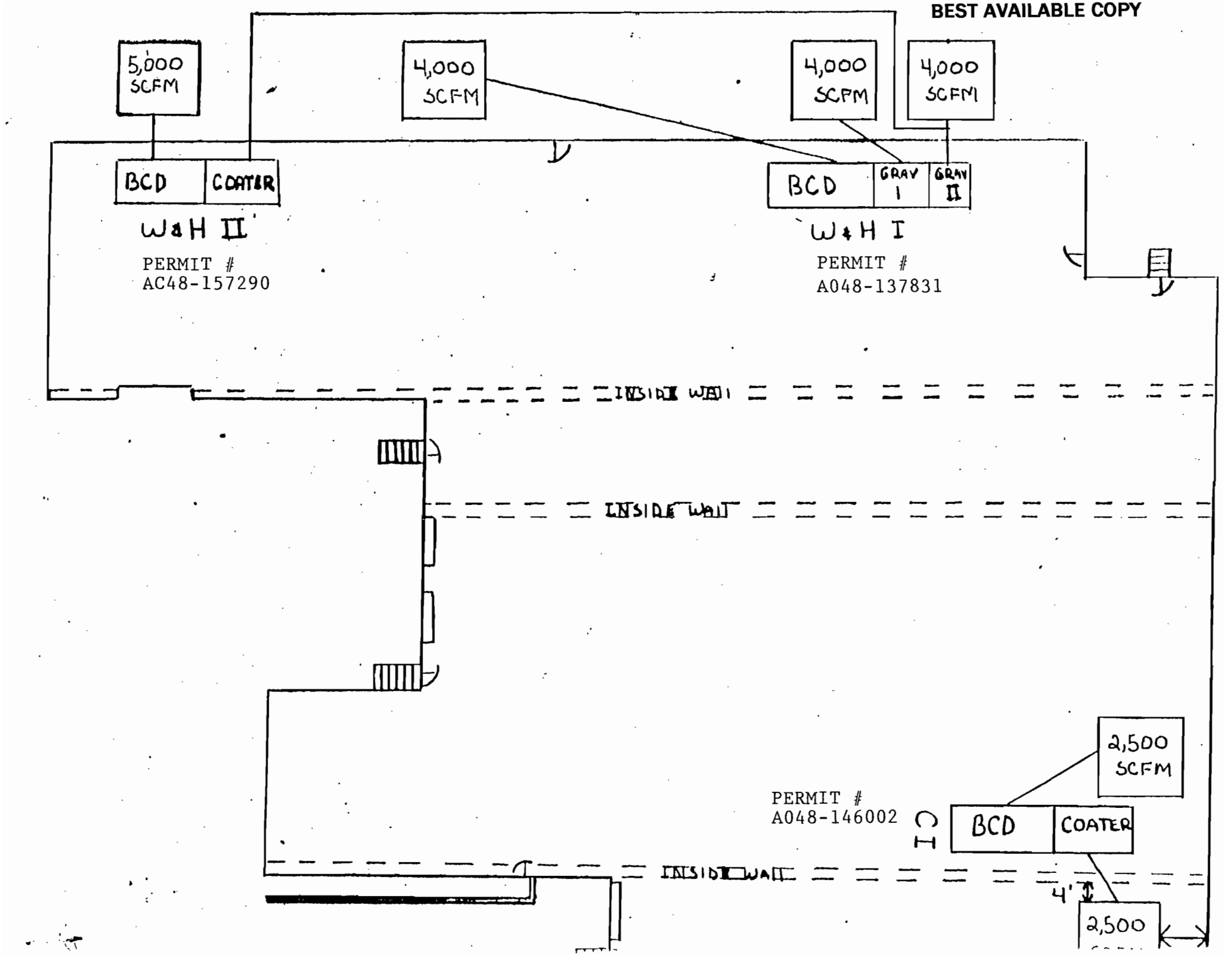
ED WARD
Vice President Production

jac

encl.

cc: Bruce Mitchell, John Turner, Dennis Nester, Stephen Neck, Bruno Ferraro, Jerome Guidry, J.R. Wilson, Chris Johns

1200 CENTRAL FLORIDA PARKWAY ORLANDO, FLORIDA 32821-9295 TELEPHONE (407) 859-7780 FAX: (407) 857-0430



SINCE 1934

fp Spiralkote, Inc.

A Subsidiary Of Fleming Packaging Corporation

October 15, 1990

Mr. Clair Fancy, P.E.
Bureau Chief, Air Regulation
Division of Air
Resources Management,
Florida Department of
Environmental Regulation
2600 Blairstone Road
Tallahassee, FL 32399-2400

Dear Mr. Fancy:

Re: KIDDER C-I COLOR PRESS WITH ONE DOWNSTREAM FLEXO COATER
PERMIT #A048-146002

We wish to notify you that we are adding a second 2500 CFM catalytic incinerator to this press. This incinerator is identical to the existing incinerator on the press. The incinerator was left over after the sale of Kidder II and III stack presses. The incinerator will receive the solvent from the downstream coater deck. This addition will:

1. provide us with enough air volume to work on improving capture which is marginal with one incinerator.

2. allow us to run trials on water base coatings

3. extend catalyst life by eliminating peak temperatures which exceed 850°F (550°F is min. temp.)

No increase in emissions will occur as a result of this change. The existing 2500 CFM incinerator will continue to control the emissions of the central impression printed decks with their associated between color dryers and overhead tunnel oven.

If you have any questions on this matter, please call.

Sincerely,

ED WARD
Vice President Production

jac

encl.
cc: Bruce Mitchell, John Turner, Dennis Nester, Stephen Neck, Bruno Ferraro, Jerome Guidry, J.R. Wilson, Chris Johns

1200 CENTRAL FLORIDA PARKWAY ORLANDO, FLORIDA 32821-9295 TELEPHONE (407) 859-7780 FAX: (407) 857-0430

SINCE 1934

fp Spiralkote, Inc.

A Subsidiary Of Fleming Packaging Corporation

October 12, 1990

Mr. Clair Fancy, P.E.
Bureau Chief, Air Regulation
Division of Air
Resources Management,
Florida Department of
Environmental Regulation
Twin Towers Office Bldg
2600 Blairstone Road
Tallahassee FL 32399-2400

Dear Mr. Fancy:

Re: 36" WH-I 746 CC 6 COLOR PRESS WITH TWO DOWNSTREAM FLEXO-GRAVURE COATERS - PERMIT #A048-137831

Please insert the attached drawings to our permit. The drawings show that we have directed a second source to the incinerator serving the flexogravure II coating deck.

The press has three 4000 CFM incinerators. One is attached to the 6 color deck; a second on the first flexogravure coater; and a third on the second infrequently used flexogravure coater. The third incinerator and second coating deck have only been utilized 2% of the time since installation in 1986.

The drawing shows that the coating deck from the 52" WH-II 746ST - Permit # (AC48-157290) will also utilize the incinerator. Either one or the other will use the incinerator but not simultaneously.

There will be no increase in emissions as a result of this change.

If there are any questions concerning this matter, please call.

Sincerely,

Ed Ward

ED WARD
Vice President Production

jac

encl.

cc: Bruce Mitchell, John Turner, Dennis Nester, Stephen Neck, Bruno Ferraro, Jerome Guidry, J.R. Wilson, Chris Johns

1200 CENTRAL FLORIDA PARKWAY ORLANDO, FLORIDA 32821-9295 TELEPHONE (407) 859-7780 FAX. (407) 857-0430

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY - REGION IV
AIR, PESTICIDES & TOXICS MANAGEMENT DIVISION
345 Courtland Street, N. E.
Atlanta, Georgia 30365
Fax Number:FTS 257-5207 or 404/347-5207

FACSIMILE TRANSMISSION SHEET

DATE: 10/4/90 NUMBER OF PAGES (Including this sheet) 4

(Preparer must number all pages)

TO: Bruce Mitchell PHONE: _____

ADDRESS: _____ FAX NUMBER: _____

FROM: Mark Armentrout PHONE: 404/347-2904

If the following pages are received poorly, please call _____

at FTS 257-_____ or 404/347-_____.

SPECIAL INSTRUCTIONS FOR RECEIVER: FYI

Summary of Recent Permitting Actions For Printing Presses in Region IV

SOURCE	LOCATION	TYPE	CONTROL	DATE	Efficiency
R.J. Reynolds	Rural Hall, NC	Rotogravure Presses	Regenerative Thermal Incinerator	03/01/89	90.25%
World Color Press	Dyersburg, TN	Rotogravure Presses	Carbon Adsorption	04/17/89	90.00%
Printpack Inc.	Villa Rica, GA	Flexographic Presses	Catalytic Incineration	11/02/89	90.25% new bldg 80.75% old bldg.
Maxwell Commun. Corporation	Dickson, TN	Rotogravure Presses	Carbon Adsorption	12/08/89	90.00%
R.R. Donnelley	Gallatin, TN	Rotogravure Presses	Carbon Adsorption	Pending	90.00%

CAPTURE SYSTEMS

RJR was permitted for total enclosure with individual capture systems for each press.

Maxwell Communications was permitted for total enclosure for the press room rather than individual units.

Printpack was permitted for total enclosure in their proposed new facility. Two presses will be added to their existing print building with a capture efficiency of 85 percent.

World Color Press was permitted for the capture system to include the total press room.

R.R. Donnelley is being permitted for total building enclosure with 98% efficient carbon absorption.

TABLE 1. TOTAL ENCLOSURE CRITERIA SATISFIED AT ADVANCED PRINTING TECHNOLOGY IN MORGANTOWN, PENNSYLVANIA

Criteria No.	Satisfied
1. Openings limited to makeup air and exhaust ducts and NDO's	Yes
2. Total area of NDO's not to exceed 5 percent of total surface area	Yes
3. Access doors and windows should be closed during normal operation	Yes
4. The average inward face velocity across all NDO's must be at least 200 ft/min	Yes
5. All sources of emissions within the enclosure shall be at least 4 equivalent diameters away from each NDO	Yes

Also, as outlined in the April 16, 1990, memorandum from John Seitz on guidelines for developing a state protocol for the measurement of capture efficiency (enclosed), the press room in which the presses will be installed should meet the following criteria to meet the requirements for a total enclosure and assure 100% capture of solvent emissions:

(a) access doors and windows remain closed during routine operation;

(b) interior of the enclosure kept at a negative pressure;

(c) air flow through all natural draft openings (NDO) at least 200 feet per minute (fpm) with verification of continuous flow into the enclosure (no verification is needed if flow into the enclosure is at least 500 fpm);

(d) source of VOC at least four equivalent diameters away from NDO; and

(e) total area of all NDO is less than 5% of the surface area of the enclosure.

In summary, the arguments provided by the applicant for not achieving LAER do not appear to be convincing. Therefore, the applicant must address the above outstanding issues before the issuance of the final permits.

Emissions Offsets and Other Considerations

Due to the fact that a SIP call was issued requiring that the four ozone nonattainment counties within the Nashville metropolitan nonattainment area be subjected to obtaining VOC offsets for sources such as R. R. Donnelley, it is EPA's position that offsets should be obtained by this permit prior to issuance. Under Section 113(a)(5) of the Clean Air Act (CAA), EPA may issue an order prohibiting the construction or modification of any major stationary source in any area to which 110(a)(2)(I) and Part D apply.

Further, Section 173(1) of the CAA sets out four conditions which must be met prior to the issuance of a permit. In summary, these are as follows: (1) reasonable further progress must be demonstrated, (2) LAER must be implemented, (3) sources owned by the source in question must be subject to emission limitations and are in compliance and; (4) the applicable implementation plan is being carried out for the nonattainment area. The determination did not contain proper information to satisfactorily address items 1 and 3 above.

meeting @ BAA @ Spiralkote, Inc.

1:00 p.m.
9/24/90

Bruce Mitchell	DER/DARM/BAR	(404) 499-1344
Robert Wilson J.R.	Spiralkote	(407) 859-7780
Chris Johns	"	"
E J W & AD JR	"	"

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee
To: Location:
To: Location:
To: Location:
From: Date:

Interoffice Memorandum

To: County Air Program Administrators
District Air Program Administrators

Attn: Compliance Engineers and Permitting Engineers

From: Clair Fancy

Date: April 15, 1990

Subj: VOC Capture Guidelines

Enclosed are two copies of an EPA document, "Guidance on addressing Capture Efficiency in Enforcing VOC SIP Regulations", dated March 16, 1990. These guidelines are important documents for ensuring consistency in determining capture of VOC's for destruction in incineration devices. The following general procedures apply until we have gained sufficient experience to standardize the application of these procedures.

(1) Permitting and compliance engineers need to work together to select the applicable protocol(s) for sources on a case-by-case basis.

(2) ASP approval is not required for application of these procedures to new permits as long as the test method (25A, 25, 18, etc) for a particular process is consistent with our rules. If they are to be used in lieu of specific conditions in an existing permit, the conditions in the construction and operating permits need to be revised. Also if their use results in a change in the reference test method (e.g. RM25 to 25A or RM24 to these protocols) the ASP process applies.

(3) Syed Arif, Air Compliance Engineer, will be the DARM's coordinator for application of these procedures and is the contact for any questions regarding interpretation.

(4) Strict application of the capture protocol is needed to improve enforceability of VOC violations. Note that the method of determining VOC content in the liquid phase is much more complex but needs to be done. This would have made some of our major enforcement cases much easier.

(5) We are attempting to get a one-day training course on these procedures during the EPA's VOC workshop in Tampa during July.

(6) Note that this package has very explicit guidelines for the different protocols, e.g. face velocities of 200 ft/minute for temporary total enclosures, etc.

Your comments or recommendations will be appreciated.

CF/JB/ht

Enclosures

cc: DARM Permitting Engineers
DARM Compliance Engineers

EMTIC Workshop Participants:

Attached are the VOC Capture Efficiency Procedures you requested. Sorry for the delay in sending them out, but we wanted to be sure to distribute the final version. If you have any questions, feel free to contact me at (919) 541-1064 or Gary McAlister at (919) 541-1062.

Candace Sorrell

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

MAR 16 1990

MEMORANDUM

SUBJECT: Guidance on Addressing Capture Efficiency In Enforcing VOC SIP Regulations

FROM: John S. Seitz, Director
Stationary Source Compliance Division

Michael S. Alushin, Associate Enforcement Counsel
Office of Enforcement and Compliance Monitoring

TO: Air Management Division Directors
Regions III and IX

Air and Waste Management Division Director
Region II

Air, Pesticides and Toxics Management Division Directors
Region I, IV, and VI

Air and Radiation Division Director
Region V

Air and Toxics Division Directors
Regions VII, VIII, and X

Regional Counsels, Regions I - X

SUMMARY

This memorandum is guidance to the Regions on how to address capture efficiency when enforcing current state implementation plan (SIP) regulations limiting volatile organic compound (VOC) emissions. It requires the Regions to use capture efficiency test protocols being developed by OAQPS. It also suggests States use these protocols as well when resolving cases against violators.

BACKGROUND

Capture Efficiency Requirements in SIPs

Many SIP regulations of VOC emissions allow the regulated source to comply with the emission limit using add-on control equipment, such as incinerators. To determine the efficiency of these controls in reducing VOC emissions, it is necessary to measure how much of the total VOC emissions from the regulated source is captured and delivered to the device that destroys the VOC. The capture efficiency (CE) of VOC control equipment is, therefore, a critical component of a compliance determination at a facility which is using control equipment to comply with SIP VOC emission limits. On August 7, 1986, EPA issued guidance which substantially restricted a source's option to try to reformulate its coatings and comply with VOC limits without control equipment. As a result, more sources are installing equipment, the CE of which must be measured.

Capture Efficiency Test Protocols and the Post - 1987 Process

Most of the current SIPs do not specify how EPA or the States should measure CE. To date EPA has not published a Reference Test Method for CE. On May 25, 1989, OAQPS issued guidance for correcting capture efficiency regulations in a memorandum from Gerald Emison entitled "Correcting Capture Efficiency (CE) Regulations". This guidance used as a basis a memorandum dated July 7, 1980 from James Berry, ESD to Doug Cook, Region IV regarding the Determination of Capture Efficiency to describe the generally accepted principles according to which CE tests should be conducted. Further, OAQPS is developing methods for testing capture efficiency which provide for a CE test in the following ways: 1) a gas-gas material balance requiring the source to temporarily enclose the line to be tested; 2) a liquid-gas material balance for line-by-line testing; and 3) a gas-gas material balance which treats the entire facility as an enclosure. As EPA gains more experience measuring CE, new methods may become available and these methods may be updated, replaced, or superseded.

As part of the Post-1987 process to improve EPA's ability to enforce the SIP VOC regulations, EPA, through the May 25, 1989 guidance referred to above, has required the states to commit to adopt enforceable CE testing requirements into their VOC SIP regulations when EPA has CE protocols available. Until this SIP revision process is completed, however, EPA must have a consistent policy about how to measure CE to determine compliance with existing SIP emission limits. This guidance addresses the appropriate test method to use in likely enforcement settings.

CAPTURE EFFICIENCY COMPLIANCE DETERMINATIONS

SIP Compliance Determinations

Under Section 114 of the Clean Air Act, EPA clearly has authority to require sources to perform those tests reasonably required to determine compliance with a SIP emission limit. With no test method specified in the SIP to measure CE, it is incumbent upon EPA to determine compliance based on evidence which experts would agree supports a determination to a reasonable scientific certainty. In other words, EPA must decide case-by-case what evidence it must collect to prove a CE value at a facility in order to meet its burden of proof.

Where the CE at a facility is in question, the Regional enforcement program should issue a testing requirement under Section 114 to collect test data necessary to prove a CE value. The test should be conducted according to the most recent version of the CE test methods available from OAQPS[1]. There may be circumstances where the Region believes the methods are inappropriate or infeasible for a source, or the Region may have questions concerning a specific application of the method. In such cases, the Region should contact the Stationary Source Compliance Division (SSCD). SSCD will consult with the appropriate office and provide advice to the Region or arrange for the appropriate office to advise the Region directly.

Consent Decree Compliance Determinations

When negotiating a compliance schedule in a consent decree which requires the installation of VOC control equipment, the parties have an opportunity to agree to a test method and be bound by its results in determining compliance with the decree. Such consent decrees should specify the CE test protocol the facility will use to demonstrate compliance with the SIP regulation. As with initial SIP compliance determinations, EPA should use the most recent version of the CE test methods available, and incorporate the terms of the appropriate method into the decree. When negotiating the consent decree, the litigation team on the case should vary from the method only after consultation with SSCD.

---

[1] The current versions of these methods are attached to this memorandum in a document entitled "Guidelines for Developing Capture Efficiency Protocols."

STATE ENFORCEMENT CASES

When resolving cases against VOC sources on the significant violators list, EPA expects the states to include a demonstration of compliance in any resolution. Where the source uses control equipment, the demonstration should include a CE test. For these cases, EPA urges the states to use the attached test methods, and to consult with the appropriate EPA Regional office if they have questions concerning specific applications of the test methods.

Attachments

Addressees

cc: STAPPA/ALAPCO
J. Berry
J. Calcagni
J. Farmer
W. Laxton
G. McAlister
J. Silvasi
T. Williamson
G. Wood
S. Wyatt
Chief, Air Branch, Regions I - X
VOC Enforcement Contacts, Region I - X

March 13, 1990

GUIDELINES FOR DEVELOPING CAPTURE EFFICIENCY PROTOCOLS

INTRODUCTION

There are two general types of material balance approaches that may be used to measure capture efficiency (CE), commonly referred to as the gas/gas and the liquid/gas approaches. Both approaches are based on the principle that the total amount of volatile organic compounds (VOC) introduced to the process (L) is equal to the total amount of VOC that leaves the process. This latter amount would be the total captured VOC emissions (G), i.e., those emissions delivered to the control device, plus the amount of fugitive VOC emissions (F).

Capture efficiency procedures with greater details are attached. The procedures are as follows:

Procedure L - VOC in Liquid Input Stream
Procedure G.1 - Captured VOC Emissions
Procedure G.2 - Captured VOC Emissions (Dilution Technique)
Procedure F.1 - Fugitive VOC Emissions from Temporary Enclosures
Procedure F.2 - Fugitive VOC Emissions from Building Enclosures
Procedure T - Criteria for and Verification of a Permanent or Temporary Total Enclosure

The applicable procedures are the basic elements of a protocol. Since each site presents different and unique process and sampling situations, no one protocol can be expected to apply to all cases. Therefore, one must evaluate each site on a case-by-case basis and choose a suitable protocol. This protocol may not give the most accurate CE determination, but may be considered the "best compromise" after considering the limitations imposed by the specific site.

Determination of the parameters L, G, and F involves several individual measurements, each of which produces some uncertainty. An understanding of the various approaches and the probable errors (PE's) involved is helpful in guiding the selection and development of CE protocols. This error analysis uses the logarithmic differential method. (Note: The discussion considers multiple points of L, G, and F collectively. Thus, in developing a protocol, the equations should be adapted to the specific plant and account for the individual input or emission points by proper summations.)

The two general mass balance approaches have a number of variations. In this guideline, these variations will be discussed and the CE, maximum error, and PE equations will be presented. Then, estimates of the PE's will be given and summarized. Finally, an order of protocol consideration will be suggested.

A summary of the nomenclature is given below to assist in the discussion, along with a generalized coating process (see Figure 1).

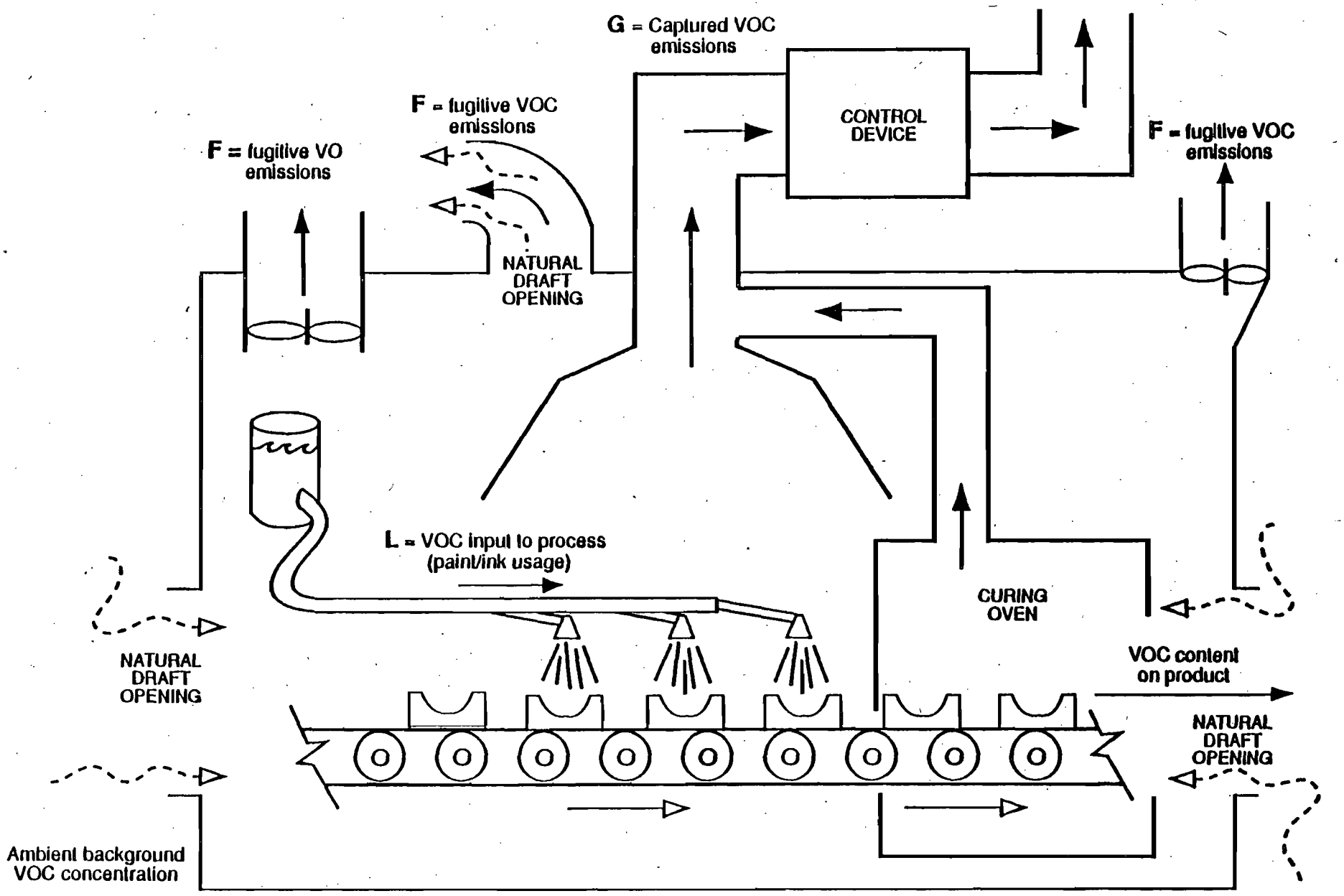


Figure 1. Generalized coating process.

NOMENCLATURE

C = VOC concentration.

C_c = C of captured VOC emissions.

CE = capture efficiency.

CV = VOC resulting from cure volatiles.

D = VOC destroyed by combustion.

E = VOC emissions from control device.

F = fugitive VOC emissions.

F_B = F from building enclosure.

F_w = F with TTE.

F_{wo} = F without TTE.

G = gaseous phase captured VOC emissions.

G_w = G with TTE.

G_{wo} = G without TTE.

L = liquid phase VOC input.

M_r = mass of VOC recovered from adsorption control device.

P = VOC remaining in product.

PO = VOC from particulate organics.

PE = probable error.

PTE = permanent total enclosure.

Q = volumetric flow rate.

R = overall reduction efficiency.

TTE = temporary total enclosure.

V = VOC content of VOC containing material.

W = liquid mass input of VOC containing material.

CAPTURE EFFICIENCY, MAXIMUM ERROR, AND PROBABLE ERROR EQUATIONS

1. GAS/GAS PROTOCOLS

The gas/gas approach is called such because only gas phase measurements are used to calculate both the VOC input and to determine the captured VOC emissions. The basic assumption is that the sum of the captured VOC emissions (G) and the fugitive VOC emissions (F) is equal to the VOC input (L), i.e., $G + F = L$.

The major difficulty with the gas/gas approach is the measurement of F when the emissions are not confined into a measurable configuration. Four techniques for measuring F have been proposed. The first is to measure F from a temporary total enclosure (TTE); the second is to measure G with and without a TTE and to determine F by difference; the third is to measure F from the existing building enclosure; and the fourth is to construct a permanent total enclosure (PTE). The protocols based on each of these techniques are discussed below. In each of these techniques, the background VOC concentration is assumed to be low in comparison to G.

The following sections will present the CE, maximum error, and probable error for CE (PE_{CE}) equations. Later, engineering estimates will be given and the PE_{CE}'s for each of the protocols will be calculated and summarized.

Protocol 1a: Temporary Total Enclosure (TTE). A TTE is one that directs all the VOC emissions to the control device and to a fugitive exhaust duct. The success of this protocol lies in designing the TTE to contain the fugitive gas stream so that it can be measured with minimal effect on the normal flow patterns around the affected facility. One set of criteria for a TTE is given in Procedure T.

The general approach for this protocol is as follows: (a) Determine the captured VOC emissions without the TTE to establish a baseline; (b) install the TTE and use the baseline from (a) to determine the effect of the TTE on the process; and (c) determine the captured VOC emissions (G_w) and the fugitive VOC emissions (F_w) with the TTE. The CE is calculated as follows:

$$CE = G_w/(G_w + F_w) \qquad \text{Eq. 1}$$

The maximum error equation is (the subscripts have been omitted to simplify discussion and avoid tedious repetitions):

$$\Delta CE/CE = |\Delta G/G - \Delta G/(G + F)| + |\Delta F/(G + F)| \qquad \text{Eq. 2}$$

Note that the negative sign between the first and second terms on the right side of the equation is kept because the first term is not independent of the second term, i.e., the signs of both terms must be the same. Therefore, the effect of errors in the measurement of G is somewhat diminished.

Equation 2 gives the maximum error that could occur, i.e., it adds all individual errors; it does not allow the errors to cancel each other.

However, the likelihood that the maximum error will occur is low. It is more reasonable to use the PE, which is calculated as the square root of the sum of squares of the individual measurement errors.

To estimate the uncertainty at various CE levels, Equation 2 can be rewritten in terms of PE and CE as follows:

$$PE_{CE} = \{[PE_G - PE_G\ G/(G + F)]^2 + [PE_F\ F/(G + F)]^2\}^{1/2} \qquad \text{Eq. 3}$$

Since $G/(G + F) = CE$ and $F/(G + F) = (1 - CE)$ and assuming that $PE_G = PE_F$, then Equation 3 simplifies to:

$$PE_{CE} = 1.4\ (1 - CE)\ PE_G \qquad \text{Eq. 4}$$

Equation 4 shows that the measurement error sensitivity of this protocol is tempered by the CE level. At the 90 percent CE level, ±10 percent measurement errors in both G and F will result in ±1.4 percent uncertainty in CE. However, at the 50 percent CE level, ±10 percent would introduce ±7 percent uncertainty.

Protocol 1b: With and Without TTE. This protocol assumes that G measured with a TTE (without an exhaust fan) is equal to L. The general approach is as follows: (a) Determine the captured VOC emissions (G_{WO}) without the TTE; and (b) determine the captured VOC emissions (G_W) with the TTE. The CE is then calculated as:

$$CE = G_{WO}/G_W \qquad \text{Eq. 5}$$

The maximum error equation for this protocol is:

$$\Delta CE/CE = |\Delta G_{WO}/G_{WO}| + |\Delta G_W/G_W| \qquad \text{Eq. 6}$$

Because G_{WO} and G_W are independent measurements, their errors do not cancel each other. Assuming that the PE for both G_{WO} and G_W are equal, the PE_{CE} equation is:

$$PE_{CE} = 1.4\ PE_G \qquad \text{Eq. 7}$$

Equation 7 shows that this protocol is highly sensitive to measurement errors and should be used only after careful consideration of the errors in the measurements and the resultant uncertainty in CE. A ±10 percent measurement errors in G, when it is measured with and without the TTE, will result in ±14 percent uncertainty in CE.

Protocol 1c: Building as Enclosure. This protocol eliminates any uncertainties concerning the effect of the TTE on the CE. However, the presence of other VOC sources within the enclosure complicates matters. In addition, the number of exhaust points and the ability to measure the volumetric flows and concentrations at these points must be considered. Two options when using the building as an enclosure are discussed below:

Option A: Operate only affected facility. The first option is to shut down all other facilities so that only the affected facility is evaluated. The general approach is as follows: (a) Shut down all other sources of VOC within the building, but leave all exhaust fans on to maintain building ventilation balance; and (b) determine the fugitive VOC emissions from all exhaust points (F_B) and the captured VOC emissions (G). The CE equation for this protocol is:

$$CE = G/(G + F_B) \qquad \text{Eq. 8}$$

This equation is identical in form to Protocol 1a and the same error analysis applies. However, in this protocol, PE_G cannot be expected to equal PE_F. Thus, the PE_{CE} equation for Option A would then be:

$$PE_{CE} = (1 - CE)\ [PE_G^2 + PE_{FB}^2]^{1/2} \qquad \text{Eq. 9}$$

Again, notice that at the 90 percent CE level, ±10 percent measurement errors in either G or in F introduces ±1 percent uncertainties in CE. The effect of measurement errors on the uncertainties in CE at different CE levels are also similar for Option B.

Option B: Operate with and without affected facility. The second option is to test under two sets of conditions - one set while the affected facility is shut down and all other facilities are operating, and the other set while all facilities, including the affected facility, are operating. The F from the affected facility is then determined by difference, i.e., $F = F_W - F_{WO}$, where the subscripts "W" and "WO" refer to the conditions of "with" and "without" the affected facility operating, respectively.

The CE and maximum error equations for this protocol are:

$$CE = G/(G + F_W - F_{WO}) \qquad \text{Eq. 10}$$

$$\Delta CE/CE = \left|\Delta G/G - \Delta G/(G + F_W - F_{WO})\right| + \left|(\Delta F_W/(G + F_W - F_{WO})\right| + \left|\Delta F_{WO}/(G + F_W - F_{WO})\right| \qquad \text{Eq. 11}$$

The term, $\Delta G/G - \Delta G/(G + F_W - F_{WO})$, simplifies to $PE_G\ (1 - CE)$. By multiplying and dividing the second and third terms by the quantity $(F_W - F_{WO})$ and assuming that $F_{WO} = 0.8\ F_W$, these terms simplify to $5\ PE_{F_W}$ and $4\ PE_{F_{WO}}$. Further assuming that $PE_{F_W} = PE_{F_{WO}} = PE_F$, the PE equation for CE can be written as:

$$PE_{CE} = (1 - CE)\ [PE_G^2 + 41\ PE_F^2]^{1/2} \qquad \text{Eq. 12}$$

<u>Protocol 1d: Permanent Total Enclosure (PTE)</u>. A PTE is one that directs all VOC emissions to the control device. A set of specifications for a PTE is given in Procedure T.

If a plant installs a PTE, it becomes an integral part of the affected facility and the CE can be assumed to be 100 percent, and a CE test is not needed. However, an overall efficiency (R) determination is still required.

The equation for R is similar to that of the protocol with a temporary total enclosure (TTE). The overall efficiency (R), maximum error, and PE_R equations are as follows:

$$R = (G - E)/G \qquad \text{Eq. 13}$$

$$\Delta R/R = |\Delta G/(G - E) - \Delta G/G| + |\Delta E/(G - E)| \qquad \text{Eq. 14}$$

$$PE_R = (1/R - 1)\ [PE_G^2 + PE_E^2]^{1/2} \qquad \text{Eq. 15}$$

where E = VOC emissions leaving the control device. The measurement error sensitivities are similar to Option A of Protocol 1c.

NOTE: If all the fugitive VOC emissions from a building are directed to a control device and the building meets the specifications for a PTE, the building will be considered a PTE and the CE of all facilities within the building can be assumed to be 100 percent.

2. LIQUID/GAS PROTOCOLS

The liquid/gas approach is called such because it involves liquid phase measurements for L and gas phase measurements for G or F. The major concern with this approach is the correlation of liquid phase measurements of L with the gas phase measurements of G or F. The various approaches used for this correlation will be discussed later.

Since these protocols closely follow the gas/gas approach, the CE, maximum error, and PE_{CE} equations are presented with little discussion.

Protocol 2a: TTE. Rather than measuring G directly, it can be determined by measuring F using a TTE and determining G by difference, i.e., G = L - F. The CE is calculated as:

$$CE = (L - F)/L \qquad \text{Eq. 16}$$

The maximum error and PE_{CE} equations are:

$$\Delta CE/CE = |\Delta L/(L - F) - \Delta L/L| + |\Delta F/(L - F)| \qquad \text{Eq. 17}$$

$$PE_{CE} = (1/CE - 1)\ [PE_L^2 + PE_F^2]^{1/2} \qquad \text{Eq. 18}$$

Notice that large measurement errors in L or in F are diminished by high CE levels. The measurement error sensitivities are similar to that of Option A of Protocol 1c.

Protocol 2b: Direct Measurements. In this protocol, both L and G are measured directly. The CE is calculated as follows:

$$CE = G/L \qquad \text{Eq. 19}$$

The maximum error and PE_{CE} equations for this protocol are:

$$\Delta CE/CE = |\Delta G/G| + |\Delta L/L| \quad \text{Eq. 20}$$

$$PE_{CE} = [PE_G^2 + PE_L^2]^{1/2} \quad \text{Eq. 21}$$

This protocol is highly sensitive to measurement errors and should be used only after careful consideration of the errors in the measurements and the resultant uncertainty in CE. A ±10 percent measurement error in G or L will introduce ±10 percent uncertainty in the CE result.

Protocol 2c: Building as Enclosure. The two options under Protocol 1c are also applicable here. The measurement error sensitivities are similar to that of Protocol 1c.

Option A: Operate only affected facility within enclosure.

$$CE = (L - F_B)/L \quad \text{Eq. 22}$$

$$\Delta CE/CE = |\Delta L/(L - F_B) - \Delta L/L| + |\Delta F/(L - F_B)| \quad \text{Eq. 23}$$

$$PE_{CE} = (1/CE - 1)\,[PE_L^2 + PE_{FB}^2]^{1/2} \quad \text{Eq. 24}$$

Option B: Operate with and without affected facility.

$$CE = (L - F_W + F_{WO})/L \quad \text{Eq. 25}$$

$$\Delta CE/CE = |\Delta L/(L - F_W + F_{WO}) - \Delta L/L| + |\Delta F_W/(L - F_W + F_{WO})| + |\Delta F_{WO}/(L - F_W + F_{WO})| \quad \text{Eq. 26}$$

$$PE_{CE} = (1/CE - 1)(PE_L^2 + 41\ PE_{FB}^2)^{1/2} \quad \text{Eq. 27}$$

Protocol 2d: Permanent Total Enclosure.

$$R = (L - E)/L \quad \text{Eq. 28}$$

$$\Delta R/R = |\Delta L/(L - E) - \Delta L/L| + |\Delta E/(L - E)| \quad \text{Eq. 29}$$

$$PE_R = (1/R - 1)\,[PE_L^2 + PE_E^2]^{1/2} \quad \text{Eq. 30}$$

where E = VOC emissions leaving the control device. As seen from Equation 30, the measurement error sensitivities are similar to that of Protocol 1d.

3. LIQUID/LIQUID PROTOCOL

Protocol 3: Liquid/Liquid. When a plant uses a carbon adsorber to control VOC emissions and recovers the collected VOC, an explicit measurement of CE is not required. A liquid/liquid material balance can be used to determine overall control efficiency by directly comparing the input solvent

to the recovered solvent. The general procedure for performing a liquid/liquid material balance is described in 40 CFR 60.433.

The overall efficiency (R), maximum error, and PE_R equations for this protocol are:

$$R = M_r / L \qquad \text{Eq. 31}$$

$$\Delta R/R = |\Delta M_r/M_r| + |\Delta L/L| \qquad \text{Eq. 32}$$

where M_r is the amount of VOC recovered.

$$PE_R = [PE_M^2 + PE_L^2]^{1/2} \qquad \text{Eq. 33}$$

Equation 33 shows that this protocol is highly sensitive to measurement errors in L and in M_r.

ENGINEERING ESTIMATES OF PROBABLE ERRORS

In order to compute the magnitude of the PE in the CE determination, the magnitude of the errors of the components that make up the determination must be known or estimated. The PE's vary with individuals and with individual testing firms and are generally not known. Therefore, engineering estimates will be used in this guideline. Although the PE's for the CE are calculated using estimates that may not represent the actual conditions, the results may be used to indicate the relative merits of the various protocols. The engineering estimates of the various measurements are summarized in Table I.

Several of the protocols involve measuring volumetric flow rates (Q) in confined and unconfined gas streams and measuring the gaseous VOC concentrations. The PE for measuring Q in confined gas streams is estimated at ±5.5 percent. This figure applies to the following measurements: Q_G, Q_F, and Q_E, where the subscripts "G," "F," and "E" refer to the captured, fugitive, and emission (from control device) gas streams, respectively.

For unconfined gas streams, such as from building enclosures, the PE for measuring Q is expected to be larger than that for measuring Q from a confined gas stream because of the less than ideal conditions for flow measurements and the greater number of emission points. The PE in measuring Q_{FB} is estimated to be ±10.0 percent, where the subscript "FB" refers to the fugitive gas stream from the building enclosure.

The PE for measuring the VOC concentration (C) in confined or unconfined gas streams with a flame ionization analyzer (FIA) is estimated to be ±5.0 percent. This estimate applies to the measurements of C_G, C_F, and C_{FB}. The PE for measuring C after an incinerator device according to Method 25 is estimated to be ±20.0 percent.

For the liquid mass VOC measurements, the PE is estimated at ±2.0 percent. This estimate applies to the measurements of the liquid mass of

VOC recovered from the adsorption control device (M_r) and the liquid mass input of VOC containing material (W).

In the liquid/gas protocols, the major concern is the correlation of L with the gas phase G or F, whichever is measured. A technique is described in Procedure L whereby the VOC in the liquid is evaporated into the gas phase and an FIA is used to determine the VOC response per unit mass of VOC containing liquid. In this manner, the exact composition of the VOC in the liquids need not be determined and errors associated with the response of the VOC on the FIA are somewhat cancelled. The repeatability or the accuracy of this technique, however, has not been evaluated, but is estimated to be ±12.0 percent.

When the composition of the VOC liquid input is known and the number of components is few, Method 18 plus appropriate FIA responses may also be an acceptable analytical technique for measurement of gaseous emissions for either C_G, C_F, or C_{FB}. The PE of this measurement is also estimated to be ±12.0 percent.

The engineering estimates of the component measurements are summarized in Table I. Based on these estimates, the PE's for the various determinations were calculated using the square root of the sums of squares. These also are summarized in Table I.

TABLE I
SUMMARY OF PROBABLE ERRORS USED IN THIS GUIDELINE

Calculated PE *	Estimated PE	
PE_G = ±7.4	Q_G = ±5.5	C_G = ±5.0
PE_F = ±7.4	Q_F = ±5.5	C_F = ±5.0
PE_{FB} = ±11.2	Q_{FB} = ±10.0	C_{FB} = ±5.0
PE_L = ±12.2	W = ±2.0	V = ±12.0
PE_M = ±2.0	W = ±2.0	
PE_E = ±20.7	Q_E = ±5.5	C_E = ±20.0

*NOTE: Calculated based upon the estimated PE's

CALCULATED PROBABLE ERRORS FOR THE VARIOUS PROTOCOLS

Based on the calculated PE's from Table I, the PE's for the various protocols were calculated. The CE and PE equations and PE_{CE} for each of the protocols are summarized in Table II. The PE_{CE}'s are based on a 90 percent CE level. The PE for Protocols 1d, 2d, and 3 are based on the overall efficiency and should not be confused with the PE's given for CE only.

TABLE II
SUMMARY OF PROBABLE ERRORS AT 90 PERCENT CE LEVEL*

Protocol	CE Equations	PE Equations	PE_{CE}
GAS/GAS			
1a - TTE	$G_W/(G_W + F_W)$	$1.4\ (1 - CE)\ PE_G$	±1.1
1b - W/WO TTE	G_{WO}/G_W	$1.4\ PE_G$	±10.5
1c - Building Option A	$G/(G + F_B)$	$(1 - CE)[PE_G^2 + PE_F^2]^{1/2}$	±1.3
Option B	$G/(G + F_W - F_{WO})$	$(1 - CE)[PE_G^2 + 41\ PE_F^2]^{1/2}$	±7.2
1d - PTE	$R = (G - E)/G$	$(1/R - 1)[PE_G^2 + PE_E^2]^{1/2}$	±2.4*
LIQUID/GAS			
2a - TTE	$(L - F)/L$	$(1/CE - 1)[PE_L^2 + PE_F^2]^{1/2}$	±1.6
2b - Direct	G/L	$[PE_G^2 + PE_L^2]^{1/2}$	±14.3
2c - Building Option A	$(L - F_B)/L$	$(1/CE - 1)[PE_L^2 + PE_{FB}^2]^{1/2}$	±1.8
Option B	$(L - F_W + F_{WO})/L$	$(1/CE - 1)[PE_L^2 + 41\ PE_{FB}^2]^{1/2}$	±8.1
2d - PTE	$R = (L - E)/L$	$(1/R - 1)[PE_L^2 + PE_E^2]^{1/2}$	±2.7*
LIQUID/LIQUID			
3	$R = M_r/L$	$[PE_M^2 + PE_L^2]^{1/2}$	±12.3*

* **NOTE:** Protocols 1d, 2d, and 3 are based on overall reduction efficiency. The PE_{CE}'s for the other protocols will be higher than shown if destruction efficiency PE's are included.

Based solely on the PE for each protocol, a suggested order in which the protocols should be considered is given in Table III. The limitations and rationale follow the table.

TABLE III
SUGGESTED ORDER OF CONSIDERATION

Order	Protocol	PE_{CE}
I	Protocol 1d or 2d - PTE	2.7*
II	Option A of Protocol 1c or 2c - Building as enclosure	1.8**
III	Protocol 1a or 2a - TTE	1.6**
IV	Protocol 3 - Liquid/liquid	12.3*

NOTE: Other protocols will be considered on a case-by-case basis.
* Based on overall efficiency, not capture efficiency.
** Based on 90% capture efficiency, values for different efficiencies must be calculated using the equations in TABLE II.

I. Protocol 1d or 2d - PTE. The protocols that incorporate a PTE should be considered as the best solution to the measurement of CE. A PTE is an integral part of the process and, therefore, the CE of the affected facility would always be 100 percent. As a result, better overall efficiency tests can be conducted for a variety of process conditions.

II. Option A of Protocol 1c or 2c - Building as Enclosure. Using the building as an enclosure has the advantage of eliminating any uncertainties concerning the effect of a TTE on the CE. The biggest disadvantage with these protocols is the loss of production from all the other facilities. Before these protocols are used, the following must be determined:

A. Are the exhaust points from the building accessible? Can the flow rates and VOC concentrations be measured?

B. Are the number of exhaust points such that the fugitive emission rate be measured within a reasonable length of time?

C. Would the VOC concentration from the exhaust points represent only the affected facility, and not fugitive VOC from other sources?

D. Is the loss of production from all the other facilities tolerable?

If the answer to any of the above questions is negative, then these protocols should not be used.

III. Protocols 1a or 2a - TTE. As mentioned earlier, the success of these protocols depends on designing the TTE to contain the fugitive gas stream so that it can be measured with minimal effect on the normal flow patterns around the affected facility or on the amount of the fugitive emissions.

If the TTE is incorrectly designed, it may introduce a bias. Each percent bias in G introduces one percent bias in CE. To minimize the bias, one approach is to establish a baseline concentration and flow rate of G without the TTE and to match this baseline after the TTE is installed. This approach, however, requires a relatively constant source. If the concentration inside the enclosure increases above the background level, the measured CE will also be biased high. No estimates have been made as to the magnitude of the bias.

Other factors that should be considered when selecting this protocol are the cost of the TTE (including the fugitive VOC exhaust fan), effect, if any, of the TTE on the quality of the product, loss in production due to down time, and safety and health hazards due to the confined nature of the TTE.

IV. Protocol 3 - Liquid/Liquid. This protocol is limited to processes that recover the VOC.

PROCESS AND METHOD CONSIDERATIONS

In the following discussion, the effect of process and method considerations will be discussed only for Protocols 1a (Gas/Gas with TTE), 2b (Liquid/Gas Direct Measurements), and 3 (Liquid/Liquid).

1. VOC remaining in product or emitted downstream (e.g., process wastewater, scrapped process feed) of affected facility.

Treatment of this situation depends on whether the VOC remaining in the product or emitted downstream (P) are considered to be fugitive emissions. If P is considered to be fugitive emissions, then the measurement of F would be biased low, i.e., rather than the total fugitive (F + P) being determined, only F is measured. If F′ is the true fugitive emissions (where F′ = F + P), then the CE equations are as follows:

Protocol 1a: $CE = G/(G + F')$
Protocol 2b: $CE = G/L$
Protocol 3 : $R = M_r/L$

Since F is not measured directly in Protocols 2b and 3, P will not affect the determination of CE or R.

Consider the following two examples: (Example 1) L = 100, G = 80, F = 10, and P = 10; and (Example 2) L = 100, G = 60, F = 10, P = 30. If P is considered to be a fugitive emission, the correct CE are as follows:

Example 1: CE = 80/(80 + 10 + 10) or 80/100 = 80.0 percent
Example 2: CE = 60/(60 + 10 + 30) or 60/100 = 60.0 percent

The calculated CE for the examples are:

Example 1:

Protocol 1a: CE = G/(G + F) = 80/(80 + 10) = 88.9 percent.

Protocol 2b: CE = G/L = 80/100 = 80.0 percent.

Example 2:

Protocol 1a: CE = 60/(60 + 10) = 85.7 percent.

Protocol 2b: CE = 60/100 = 60.0 percent.

Each percent P introduces a positive bias in CE of about 0.9 percent CE (note this is absolute percent). In Example 1, a P of 10 percent raised the CE from 80.0 to 88.9 (8.9/10 = 0.89). In Example 2, a P of 30 percent raised the CE from 60 to 85.7 (25.7/30 = 0.86).

If P is not considered to be fugitive emissions, then the amount of L measured will be biased high by the amount of P, i.e., the true L' = L - P. The correct CE for Example 1 above is 80/90 or 88.9 percent. For Example 2, the correct CE is 60/70 or 85.7 percent. Since L is not measured in Protocol 1a, its calculated CE would be correct as seen in the above calculations, whereas Protocols 2b and 3 would give negative biases in the CE. Each percent P introduces a negative bias in CE of about 0.9 percent CE.

2. Facilities using exhaust recirculation or direct fired ovens.

In facilities using exhaust recirculation or direct fired ovens, some of the VOC in the captured VOC emission stream will be oxidized and the measurement of G would be biased low by the amount of VOC destroyed (D). The true captured emissions (G') would be equal to (G + D), i.e., the correct CE equations are as follows:

Protocol 1a: CE = (G')/(G'+ F)

Protocol 2b: CE = (G')/L

Protocol 3: R = (M_r')/L, where M_r' = M_r + D

As seen from these equations, Protocols 2b and 3 are most affected by this occurrence. Protocol 1a is much less affected. Consider the following two examples: (Example 1) L = 100, G = 80, F = 10, and D = 10; and (Example 2) L = 100, G = 60, F = 10, D = 30. The correct CE is 90.0 percent for both examples. The calculated CE for the examples are:

Example 1:

Protocol 1a: CE = G/(G + F) = 80/(80 + 10) = 88.9 percent.

Protocol 2b: CE = G/L = 80/100 = 80.0 percent.

Example 2:

Protocol 1a: CE = 60/(60 + 10) = 85.7 percent.

Protocol 2b: CE = 60/100 = 60.0 percent.

The R determined by Protocol 3 would be biased low because the amount of VOC recovered will not reflect the amount of VOC destroyed. In Protocols 2b and 3, each percent D introduces about 1 percent negative bias in the CE or R. In Protocol 1a, a 10 percent bias introduces about 1 percent bias in CE at the 90 percent CE level.

3. Presence of particulate organic aerosols.

Particulate matter organics VOC (PO) in the captured VOC emission stream will cause the measurement of G to be biased high by the amount present. Their effect would be similar to that discussed in (2) above, except the CE will have a positive bias. Protocol 3 will not be affected by PO. The CE equations should be as follows:

Protocol 1a: $CE = (G + PO)/(G + PO + F)$
Protocol 2b: $CE = (G + PO)/L$
Protocol 3: $R = M_r/L$

4. Occurrence of cure volatiles.

Cure volatiles (CV) in the captured VOC emission stream will be included as G. Letting G' or M_r' be the amount of VOC not including CV, the CE equations would be as follows:

Protocol 1a: $CE = (G' + CV)/(G' + CV + F)$
Protocol 2b: $CE = (G' + CV)/L$
Protocol 3: $R = (M_r' + CV)/L$

The correctness of the CE depends on the measurement of L. If the method used for determining the VOC content of the liquid input measures CV, then the measurement of G would correctly reflect the quantity (G' + CV) or (M_r' + CV) and all three protocols would provide the correct CE.

However, if the determination of L does not include CV, then the measured G or M_r would not be correct. Consider the following two examples: (Example 1) L = 100, G' = 90, CV = 10, and F = 10; and (Example 2) L = 100, G' = 90, CV = 20, and F = 10. The correct CE would be as follows:

Example 1: $CE = (90 + 10)/(100 + 10) = 90.9$ percent
Example 2: $CE = (90 + 20)/(100 + 20) = 91.7$ percent

The calculated CE for the examples are:

Example 1:
Protocol 1a: $CE = G/(G + F) = (90 + 10)/(90 + 10 + 10) = 90.9$ percent.
Protocol 2b: $CE = G/L = (90 + 10)/100 = 100.0$ percent.
Example 2:
Protocol 1a: $CE = (90 + 20)/(90 + 20 + 10) = 91.7$ percent.
Protocol 2b: $CE = (90 + 20)/100 = 110.0$ percent.

As can be seen, Protocol 1a gives the correct result, whereas Protocol 2b gives positively biased CE's. Each percent CV increases the CE by one percent CE. Protocol 3 is similarly affected as with Protocol 2b, since the recovered VOC would include CV.

5. Coatings that contain solvents with different volatilities.

The F stream may contain a higher proportion of the more volatile solvents. If an FIA is used, the measurement of F may not reflect the actual amount of VOC in the F or G stream because of the different response factors. If this is the case, Method 18, alone or along with appropriate response factors of an FIA, may need to be used to characterize F or G.

ALTERNATIVES TO LINE-BY-LINE TESTING FOR OVERALL REDUCTION EFFICIENCY

The following are two alternatives that may be used in lieu of line-by-line testing for determining the overall reduction efficiency of multiple coating lines within a single building. The underlying assumption for both alternatives is that the building meets the criteria for a PTE (see Procedure T).

1. Alternative 1. This alternative applies when the building qualifies as a PTE and all of the emissions from the building are ducted to one control device or to different control devices with equal control efficiency.

The overall reduction efficiency for each line is the control efficiency of the control device(s).

> Example 1. A facility contains three coating lines, two of which are subject to a RACT limit of 85 percent control and the other is subject to a LAER limit of 95 percent control. All three lines are ducted to a control device with an efficiency of 90 percent. In this example, the two lines subject to RACT are in compliance, but the line subject to LAER is not. In order for all lines to be in compliance, the efficiency of the control device must be increased to at least 95 percent.

2. Alternative 2. This alternative applies when the building qualifies as a PTE and all of the emissions from the building are ducted to two or more control devices with different control efficiencies.

The overall reduction efficiency for each line is assumed to be the control efficiency of the least efficient control device.

> Example 2a. A facility contains three lines all of which are subject to a RACT limit of 85 percent control. The lines are ducted to three control devices having the following efficiencies:
>
> Line 1 - 97% control efficiency
> Line 2 - 95% control efficiency
> Line 3 - 85% control efficiency
>
> The overall reduction efficiency for each line is assumed to be 85 percent, the lowest measured efficiency of the three control devices. Because all three lines are subject to a limit of 85 percent control, all lines are in compliance.

Example 2b. A facility contains three lines as described above, except Line 1 is subject to a LAER limit of 95 percent control. Because the overall reduction efficiency of each line is assumed to be 85 percent, Line 1 is not in compliance with the 95 percent standard. In order for Line 1 (and hence, all lines) to be in compliance, the control efficiency of Line 3 must be increased to at least 95 percent.

March 13, 1990

VOC CAPTURE EFFICIENCY
Procedure L - VOC Input

1. INTRODUCTION

1.1 Applicability. This procedure is applicable for determining the input of volatile organic compounds (VOC). It is intended to be used as a segment in the development of liquid/gas protocols for determining VOC capture efficiency (CE) for surface coating and printing operations.

1.2 Principle. The amount of VOC introduced to the process (L) is the sum of the products of the weight (W) of each VOC containing liquid (ink, paint, solvent, etc.) used and its VOC content (V). A sample of each VOC containing liquid is analyzed with a flame ionization analyzer (FIA) to determine V.

1.3 Estimated Measurement Uncertainty. The measurement uncertainties are estimated for each VOC containing liquid as follows: W = ±2.0 percent and V = ±12.0 percent. Based on these numbers, the probable uncertainty for L is estimated at about ±12.2 percent for each VOC containing liquid.

1.4 Sampling Requirements. A capture efficiency test shall consist of at least three sampling runs. The sampling time for each run should be at least 8 hours, unless otherwise approved.

1.5 Notes. Because this procedure is often applied in highly explosive areas, caution and care should be exercised in choosing appropriate equipment and installing and using the equipment. Mention of trade names or company products does not constitute endorsement. All gas concentrations (percent, ppm) are by volume, unless otherwise noted.

2. APPARATUS AND REAGENTS

2.1 Liquid Weight.

2.1.1 Balances/Digital Scales. To weigh drums of VOC containing liquids to within 0.2 lb.

2.1.2 Volume Measurement Apparatus (Alternative). Volume meters, flow meters, density measurement equipment, etc., as needed to achieve same accuracy as direct weight measurements.

2.2 VOC Content (Flame Ionization Analyzer Technique). The liquid sample analysis system is shown in Figures 1 and 2. The following equipment is required:

2.2.1 Sample Collection Can. An appropriately sized metal can to be used to collect VOC containing materials. The can must be constructed in such a way that it can be grounded to the coating container.

2.2.2 Needle Valves. To control gas flow.

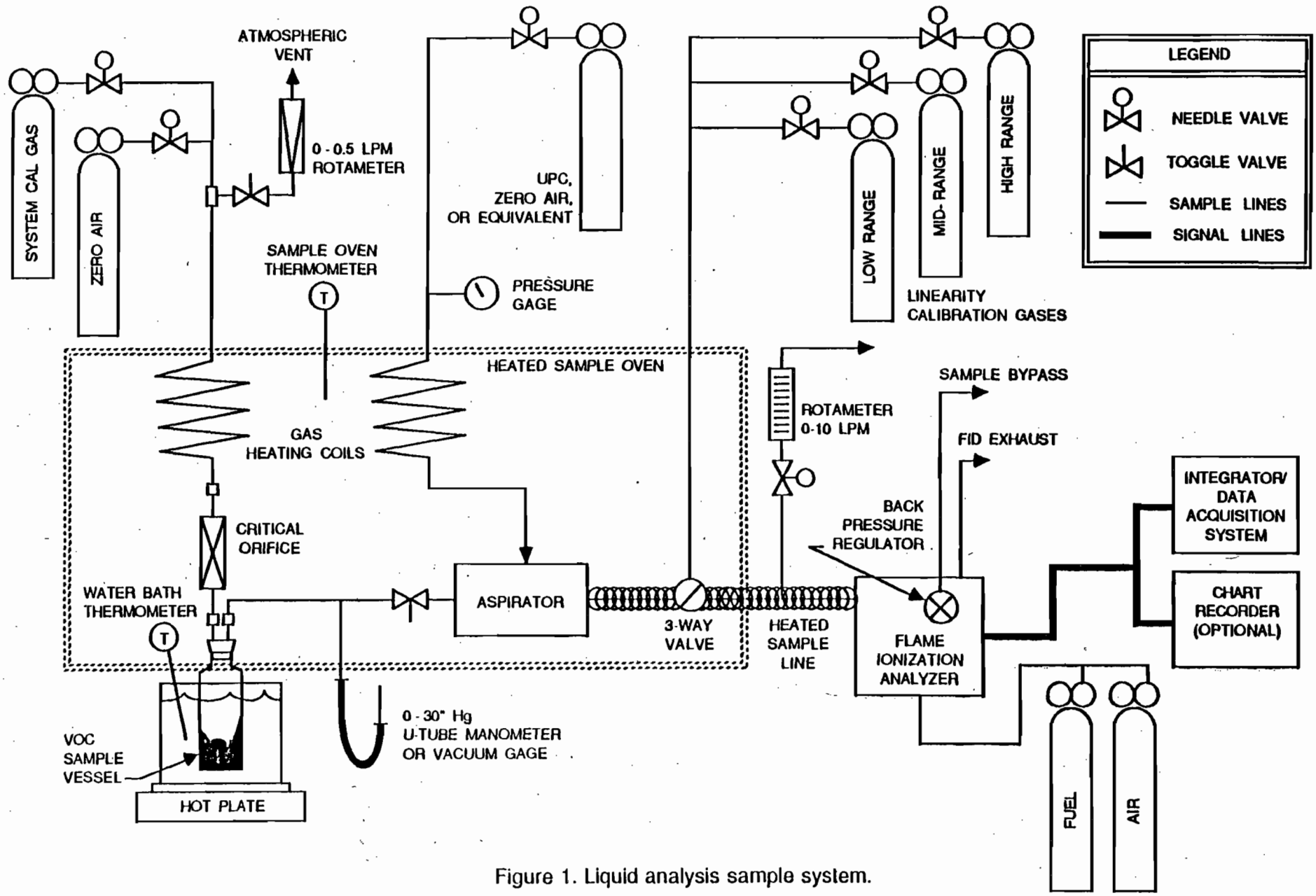


Figure 1. Liquid analysis sample system.

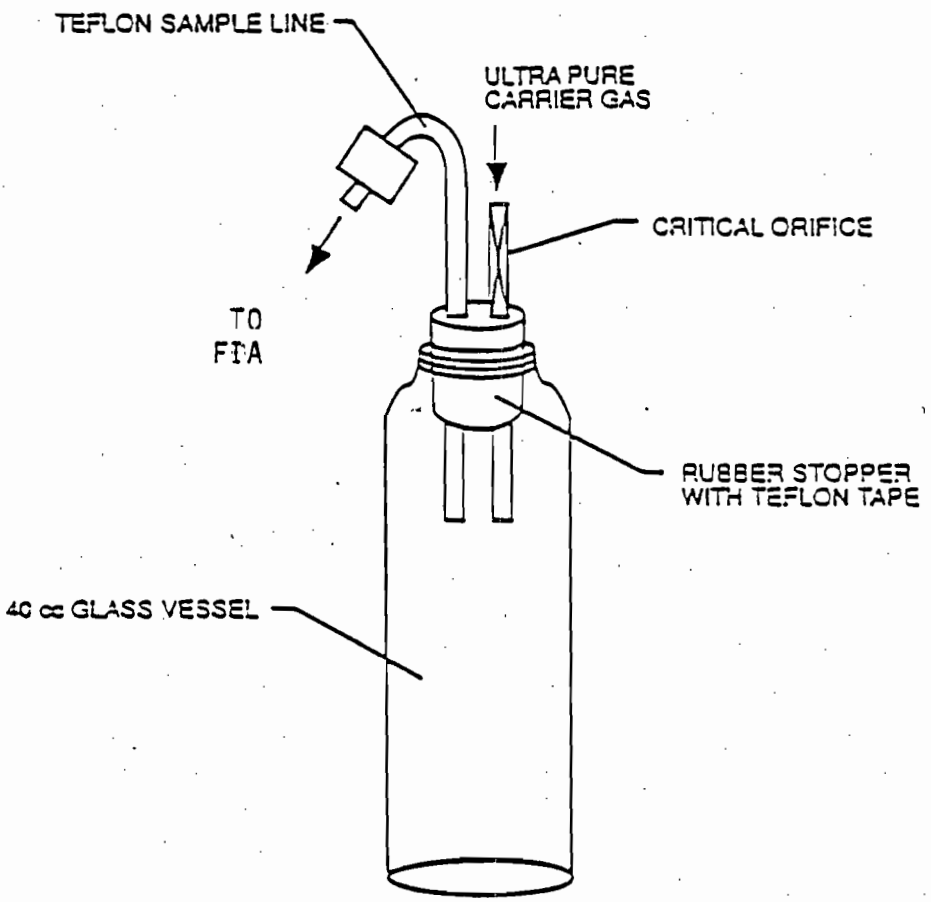


Figure 2. VOC sampling vessel.

2.2.3 Regulators. For carrier gas and calibration gas cylinders.

2.2.4 Tubing. Teflon or stainless steel tubing with diameters and lengths determined by connection requirements of equipment. The tubing between the sample oven outlet and the FIA shall be heated to maintain a temperature of 120 ± 5°C.

2.2.5 Atmospheric Vent. A tee and 0- to 0.5-liter/min rotameter placed in the sampling line between the carrier gas cylinder and the VOC sample vessel to release the excess carrier gas. A toggle valve placed between the tee and the rotameter facilitates leak tests of the analysis system.

2.2.6 Thermometer. Capable of measuring the temperature of the hot water bath to within 1°C.

2.2.7 Sample Oven. Heated enclosure, containing calibration gas coil heaters, critical orifice, aspirator, and other liquid sample analysis components, capable of maintaining a temperature of 120 ± 5°C.

2.2.8 Gas Coil Heaters. Sufficient lengths of stainless steel or Teflon tubing to allow zero and calibration gases to be heated to the sample oven temperature before entering the critical orifice or aspirator.

2.2.9 Water Bath. Capable of heating and maintaining a sample vessel temperature of 100 ± 5°C.

2.2.10 Analytical Balance. To measure ±0.001 g.

2.2.11 Disposable Syringes. 2-cc or 5-cc.

2.2.12 Sample Vessel. Glass, 40-ml septum vial. A separate vessel is needed for each sample.

2.2.13 Rubber Stopper. Two-hole stopper to accommodate 3.2-mm (1/8-in.) Teflon tubing, appropriately sized to fit the opening of the sample vessel. The rubber stopper should be wrapped in Teflon tape to provide a tighter seal and to prevent any reaction of the sample with the rubber stopper. Alternatively, any leak-free closure fabricated of non-reactive materials and accommodating the necessary tubing fittings may be used.

2.2.14 Critical Orifices. Calibrated critical orifices capable of providing constant flow rates from 50 to 250 ml/min at known pressure drops. Sapphire orifice assemblies (available from O'Keefe Controls Company) and glass capillary tubing have been found to be adequate for this application.

2.2.15 Vacuum Gauge. 0- to 760-mm (0- to 30-in.) Hg U-Tube manometer or vacuum gauge.

2.2.16 Pressure Gauge. Bourdon gauge capable of measuring the maximum air pressure at the aspirator inlet (e.g., 100 psig).

2.2.17 Aspirator. A device capable of generating sufficient vacuum at the sample vessel to create critical flow through the calibrated orifice when sufficient air pressure is present at the aspirator inlet. The aspirator must also provide sufficient sample pressure to operate the FIA. The sample is also mixed with the dilution gas within the aspirator.

2.2.18 Soap Bubble Meter. Of an appropriate size to calibrate the critical orifices in the system.

2.2.19 Organic Concentration Analyzer. An FIA with a span value of 1.5 times the expected concentration as propane; however other span values may be used if it can be demonstrated that they would provide more accurate measurements. The system shall be capable of meeting or exceeding the following specifications:

2.2.19.1 Zero Drift. Less than ±3.0 percent of the span value.

2.2.19.2 Calibration Drift. Less than ±3.0 percent of span value.

2.2.19.3 Calibration Error. Less than ±5.0 percent of the calibration gas value.

2.2.20 Integrator/Data Acquisition System. An analog or digital device or computerized data acquisition system used to integrate the FIA response or compute the average response and record measurement data. The minimum data sampling frequency for computing average or integrated values is one measurement value every 5 seconds. The device shall be capable of recording average values at least once per minute.

2.2.21 Chart Recorder (Optional). A chart recorder or similar device is recommended to provide a continuous analog display of the measurement results during the liquid sample analysis.

2.2.22 Calibration and Other Gases. For calibration, fuel, and combustion air (if required) contained in compressed gas cylinders. All calibration gases shall be traceable to NIST standards and shall be certified by the manufacturer to ±1 percent of the tag value. Additionally, the manufacturer of the cylinder should provide a recommended shelf life for each calibration gas cylinder over which the concentration does not change more than ±2 percent from the certified value. For calibration gas values not generally available, alternative methods for preparing calibration gas mixtures, such as dilution systems, may be used with prior approval.

2.2.22.1 Fuel. A 40 percent H_2/60 percent He or 40 percent H_2/60 percent N_2 gas mixture is recommended to avoid an oxygen synergism effect that reportedly occurs when oxygen concentration varies significantly from a mean value.

2.2.22.2 Carrier Gas. High purity air with less than 1 ppm of organic material (as propane) or less than 0.1 percent of the span value, whichever is greater.

2.2.22.3 FIA Linearity Calibration Gases. Low-, mid-, and high-range gas mixture standards with nominal propane concentrations of 20-30, 45-55, and

70-80 percent of the span value in air, respectively. Other calibration values and other span values may be used if it can be shown that more accurate measurements would be achieved.

2.2.22.4 System Calibration Gas. Gas mixture standard containing propane in air, approximating the undiluted VOC concentration expected for the liquid samples.

3. DETERMINATION OF LIQUID INPUT WEIGHT

3.1 Weight Difference. Determine the amount of material introduced to the process as the weight difference of the feed material before and after each sampling run. In determining the total VOC containing liquid usage, account for: (a) the initial (beginning) VOC containing liquid mixture; (b) any solvent added during the test run; (c) any coating added during the test run; and (d) any residual VOC containing liquid mixture remaining at the end of the sample run.

3.1.1 Identify all points where VOC containing liquids are introduced to the process. To obtain an accurate measurement of VOC containing liquids, start with an empty fountain (if applicable). After completing the run, drain the liquid in the fountain back into the liquid drum (if possible), and weigh the drum again. Weigh the VOC containing liquids to ±0.5 percent of the total weight (full) or ±0.1 percent of the total weight of VOC containing liquid used during the sample run, whichever is less. If the residual liquid cannot be returned to the drum, drain the fountain into a preweighed empty drum to determine the final weight of the liquid.

3.1.2 If it is not possible to measure a single representative mixture, then weigh the various components separately (e.g., if solvent is added during the sampling run, weigh the solvent before it is added to the mixture). If a fresh drum of VOC containing liquid is needed during the run, then weigh both the empty drum and fresh drum.

3.2 Volume Measurement (Alternative). If direct weight measurements are not feasible, the tester may use volume meters and flow rate meters (and density measurements) to determine the weight of liquids used if it can be demonstrated that the technique produces results equivalent to the direct weight measurements. If a single representative mixture cannot be measured, measure the components separately.

4. DETERMINATION OF VOC CONTENT IN INPUT LIQUIDS

4.1 Collection of Liquid Samples.

4.1.1 Collect a 100-ml or larger sample of the VOC containing liquid mixture at each application location at the beginning and end of each test run. A separate sample should be taken of each VOC containing liquid added to the application mixture during the test run. If a fresh drum is needed during the sampling run, then obtain a sample from the fresh drum.

4.1.2 When collecting the sample, ground the sample container to the coating drum. Fill the sample container as close to the rim as possible to minimize the amount of headspace.

4.1.3 After the sample is collected, seal the container so the sample cannot leak out or evaporate.

4.1.4 Label the container to identify clearly the contents.

4.2 Liquid Sample VOC Content.

4.2.1 Assemble the liquid VOC content analysis system as shown in Figure 1.

4.2.2 Permanently identify all of the critical orifices that may be used. Calibrate each critical orifice under the expected operating conditions (i.e., sample vacuum and temperature) against a volume meter as described in Section 5.3.

4.2.3 Label and tare the sample vessels (including the stoppers and caps) and the syringes.

4.2.4 Install an empty sample vessel and perform a leak test of the system. Close the carrier gas valve and atmospheric vent and evacuate the sample vessel to 250 mm (10 in.) Hg absolute or less using the aspirator. Close the toggle valve at the inlet to the aspirator and observe the vacuum for at least one minute. If there is any change in the sample pressure, release the vacuum, adjust or repair the apparatus as necessary and repeat the leak test.

4.2.5 Perform the analyzer calibration and linearity checks according to the procedure in Section 5.1. Record the responses to each of the calibration gases and the back-pressure setting of the FIA.

4.2.6 Establish the appropriate dilution ratio by adjusting the aspirator air supply or substituting critical orifices. Operate the aspirator at a vacuum of at least 25 mm (1 in.) Hg greater than the vacuum necessary to achieve critical flow. Select the dilution ratio so that the maximum response of the FIA to the sample does not exceed the high-range calibration gas.

4.2.7 Perform system calibration checks at two levels by introducing compressed gases at the inlet to the sample vessel while the aspirator and dilution devices are operating. Perform these checks using the carrier gas (zero concentration) and the system calibration gas. If the response to the carrier gas exceeds ±0.5 percent of span, clean or repair the apparatus and repeat the check. Adjust the dilution ratio as necessary to achieve the correct response to the upscale check, but do not adjust the analyzer calibration. Record the identification of the orifice, aspirator air supply pressure, FIA back-pressure, and the responses of the FIA to the carrier and system calibration gases.

4.2.8 After completing the above checks, inject the system calibration gas for approximately 10 minutes. Time the exact duration of the gas injection using a stopwatch. Determine the area under the FIA response curve and

calculate the system response factor based on the sample gas flow rate, gas concentration, and the duration of the injection as compared to the integrated response using Equations 2 and 3.

4.2.9 Verify that the sample oven and sample line temperatures are 120 ± 5°C and that the water bath temperature is 100° ± 5°C.

4.2.10 Fill a tared syringe with approximately 1 g of the VOC containing liquid and weigh it. Transfer the liquid to a tared sample vessel. Plug the sample vessel to minimize sample loss. Weigh the sample vessel containing the liquid to determine the amount of sample actually received. Also, as a quality control check, weigh the empty syringe to determine the amount of material delivered. The two coating sample weights should agree within ±0.02 g. If not, repeat the procedure until an acceptable sample is obtained.

4.2.11 Connect the vessel to the analysis system. Adjust the aspirator supply pressure to the correct value. Open the valve on the carrier gas supply to the sample vessel and adjust it to provide a slight excess flow to the atmospheric vent. As soon as the initial response of the FIA begins to decrease, immerse the sample vessel in the water bath. (Applying heat to the sample vessel too soon may cause the FID response to exceed the calibrated range of the instrument, and thus invalidate the analysis.)

4.2.12 Continuously measure and record the response of the FIA until all of the volatile material has been evaporated from the sample and the instrument response has returned to the baseline (i.e., response less than 0.5 percent of the span value). Observe the aspirator supply pressure, FIA back-pressure, atmospheric vent, and other system operating parameters during the run; repeat the analysis procedure if any of these parameters deviate from the values established during the system calibration checks in Section 4.2.7. After each sample perform the drift check described in Section 5.2. If the drift check results are acceptable, calculate the VOC content of the sample using the equations in Section 7. Integrate the area under the FIA response curve, or determine the average concentration response and the duration of sample analysis.

5. CALIBRATION AND QUALITY ASSURANCE

5.1 FIA Calibration and Linearity Check. Make necessary adjustments to the air and fuel supplies for the FIA and ignite the burner. Allow the FIA to warm up for the period recommended by the manufacturer. Inject a calibration gas into the measurement system and adjust the back-pressure regulator to the value required to achieve the flow rates specified by the manufacturer. Inject the zero- and the high-range calibration gases and adjust the analyzer calibration to provide the proper responses. Inject the low- and mid-range gases and record the responses of the measurement system. The calibration and linearity of the system are acceptable if the responses for all four gases are within 5 percent of the respective gas values. If the performance of the system is not acceptable, repair or adjust the system and repeat the linearity check. Conduct a calibration and linearity check after assembling the analysis system and after a major change is made to the system.

5.2 Systems Drift Checks. After each sample, repeat the system calibration checks in Section 4.2.7 before any adjustments to the FIA or measurement system are made. If the zero or calibration drift exceeds ±3 percent of the span value, discard the result and repeat the analysis.

5.3 Critical Orifice Calibration.

5.3.1 Each critical orifice must be calibrated at the specific operating conditions that it will be used. Therefore, assemble all components of the liquid sample analysis system as shown in Figure 3. A stopwatch is also required.

5.3.2 Turn on the sample oven, sample line, and water bath heaters and allow the system to reach the proper operating temperature. Adjust the aspirator to a vacuum of 380 mm (15 in.) Hg vacuum. Measure the time required for one soap bubble to move a known distance and record barometric pressure.

5.3.3 Repeat the calibration procedure at a vacuum of 406 mm (16 in.) Hg and at 25-mm (1-in.) Hg intervals until three consecutive determinations provide the same flow rate. Calculate the critical flow rate for the orifice in ml/min at standard conditions. Record the vacuum necessary to achieve critical flow.

6. NOMENCLATURE

A_L = area under the response curve of the liquid sample, area count.

A_S = area under the response curve of the calibration gas, area count.

C_S = actual concentration of system calibration gas, ppm propane.

$K = 1.830 \times 10^{-9}$ g/(ml-ppm).

L = total VOC content of liquid input, kg.

M_L = mass of liquid sample delivered to the sample vessel, g.

q = flow rate through critical orifice, ml/min.

RF = liquid analysis system response factor, g/area count.

θ_S = total gas injection time for system calibration gas during integrator calibration, min.

V_{Fj} = final VOC fraction of VOC containing liquid j.

V_{Ij} = initial VOC fraction of VOC containing liquid j.

V_{Aj} = VOC fraction of VOC containing liquid j added during the run.

V = VOC fraction of liquid sample.

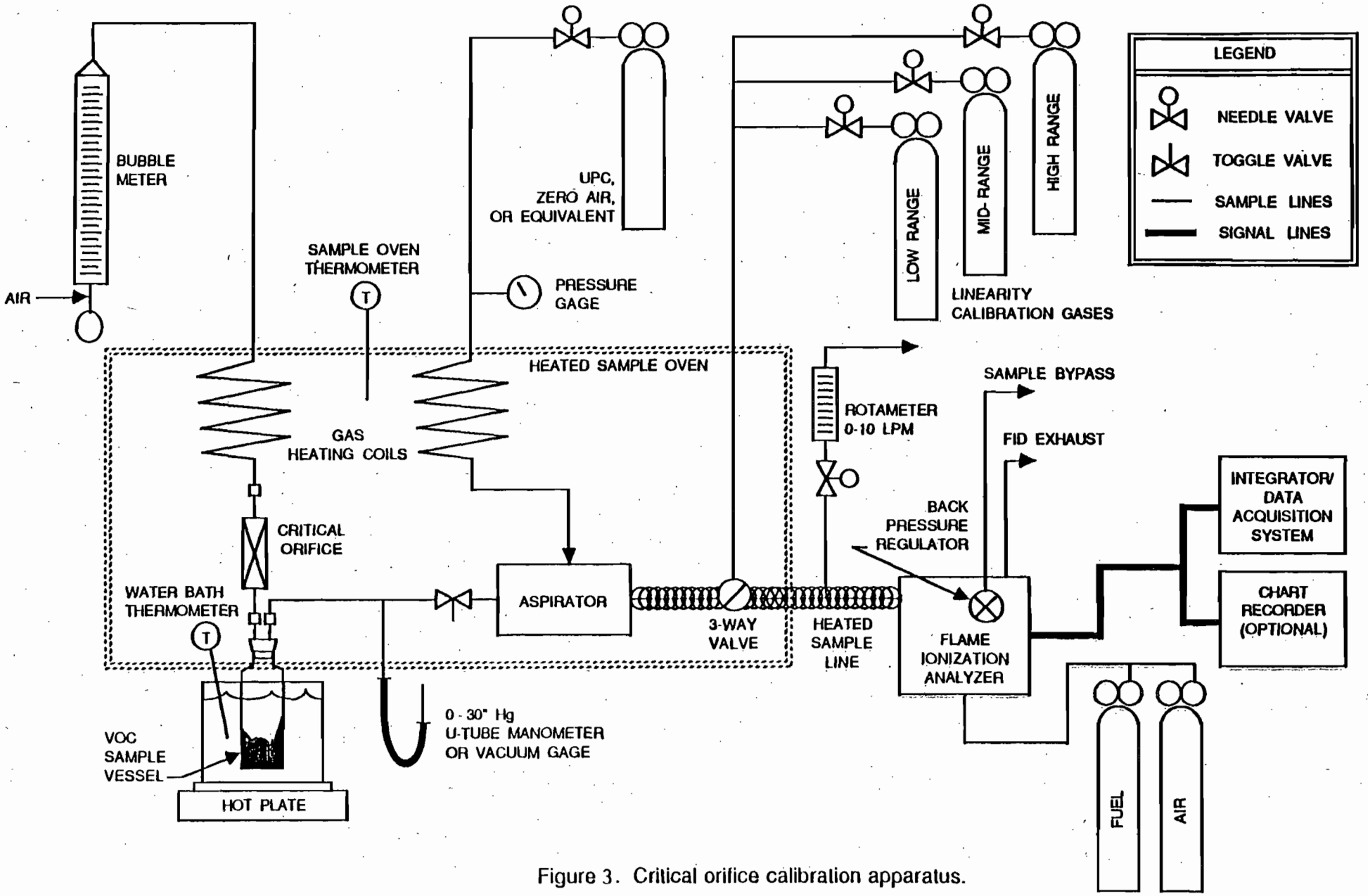


Figure 3. Critical orifice calibration apparatus.

W_{Fj} = weight of VOC containing liquid j remaining at end of the run, kg.

W_{Ij} = weight of VOC containing liquid j at beginning of the run, kg.

W_{Aj} = weight of VOC containing liquid j added during the run, kg.

7. CALCULATIONS

7.1 Total VOC Content of the Input VOC Containing Liquid.

$$L = \sum_{j=1}^{n} V_{Ij} W_{Ij} - \sum_{j=1}^{n} V_{Fj} W_{Fj} + \sum_{j=1}^{n} V_{Aj} W_{Aj} \qquad \text{Eq. 1}$$

7.2 Liquid Sample Analysis System Response Factor for Systems Using Integrators, Grams/Area Counts.

$$RF = \frac{C_S \, q \, \theta_S \, K}{A_S} \qquad \text{Eq. 2}$$

7.3 VOC Content of the Liquid Sample.

$$V = \frac{A_L \, RF}{M_L} \qquad \text{Eq. 3}$$

March 13, 1990

VOC CAPTURE EFFICIENCY
Procedure G.1 - Captured VOC Emissions

1. INTRODUCTION

1.1 Applicability. This procedure is applicable for determining the volatile organic compounds (VOC) content of captured gas streams. It is intended to be used as a segment in the development of liquid/gas or gas/gas protocols for determining VOC capture efficiency (CE) for surface coating and printing operations. The procedure may not be acceptable in certain site-specific situations, e.g., when: (1) direct fired heaters or other circumstances affect the quantity of VOC at the control device inlet; and (2) particulate organic aerosols are formed in the process and are present in the captured emissions.

1.2 Principle. The amount of VOC captured (G) is calculated as the sum of the products of the VOC content (C_{Gj}), the flow rate (Q_{Gj}), and the sample time (θ_C) from each captured emissions point.

1.3 Estimated Measurement Uncertainty. The measurement uncertainties are estimated for each captured or fugitive emissions point as follows: Q_{Gj} = ±5.5 percent and C_{Gj} = ±5.0 percent. Based on these numbers, the probable uncertainty for G is estimated at about ±7.4 percent.

1.4 Sampling Requirements. A capture efficiency test shall consist of at least three sampling runs. The sampling time for each run should be at least 8 hours, unless otherwise approved.

1.5 Notes. Because this procedure is often applied in highly explosive areas, caution and care should be exercised in choosing appropriate equipment and installing and using the equipment. Mention of trade names or company products does not constitute endorsement. All gas concentrations (percent, ppm) are by volume, unless otherwise noted.

2. APPARATUS AND REAGENTS

2.1 Gas VOC Concentration. A schematic of the measurement system is shown in Figure 1. The main components are described below:

2.1.1 Sample Probe. Stainless steel, or equivalent. The probe shall be heated to prevent VOC condensation.

2.1.2 Calibration Valve Assembly. Three-way valve assembly at the outlet of sample probe to direct the zero and calibration gases to the analyzer. Other methods, such as quick-connect lines, to route calibration gases to the outlet of the sample probe are acceptable.

2.1.3 Sample Line. Stainless steel or Teflon tubing to transport the sample gas to the analyzer. The sample line must be heated to prevent condensation.

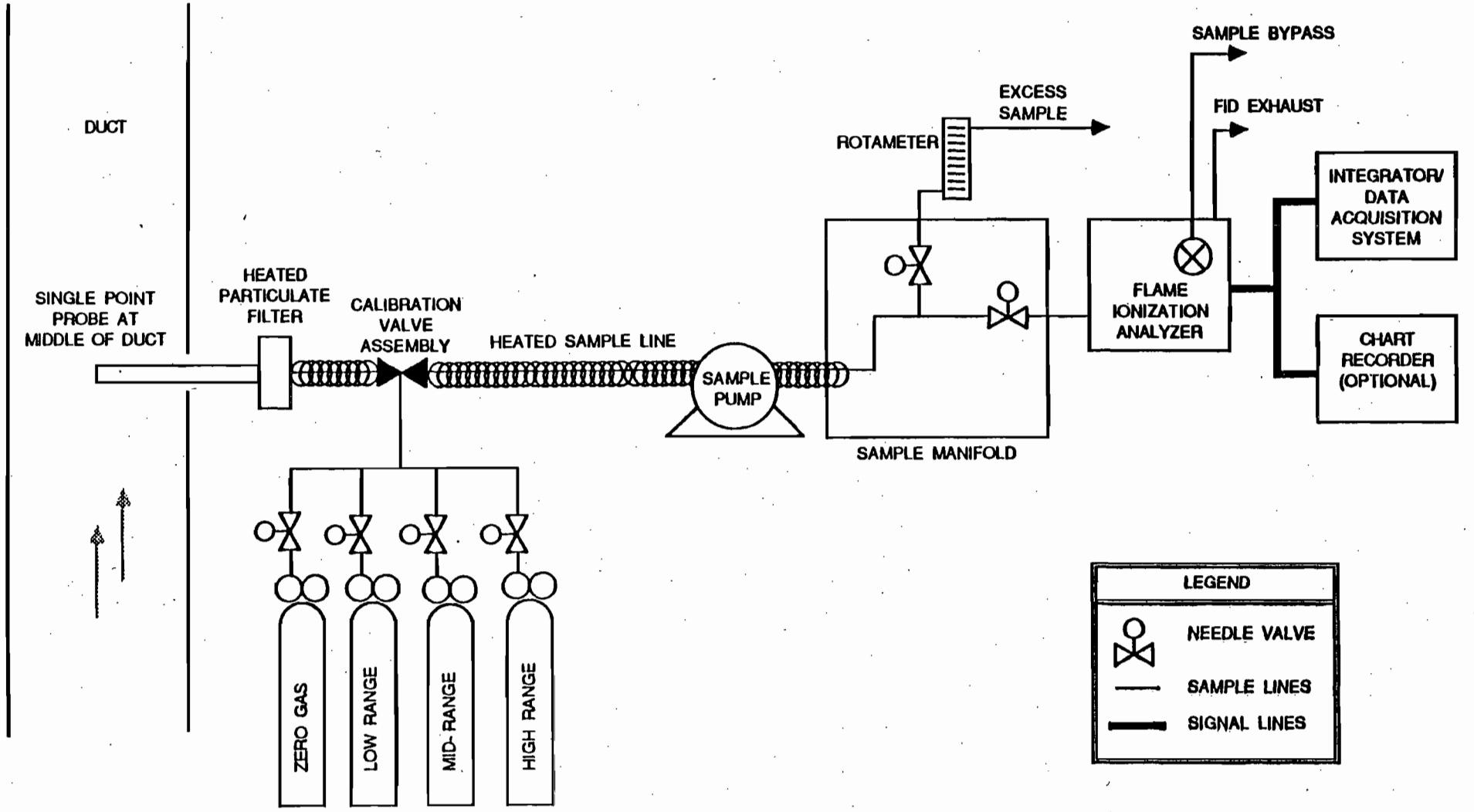


Figure 1. Gas VOC concentration measurement system.

2.1.4 Sample Pump. A leak-free pump, to pull the sample gas through the system at a flow rate sufficient to minimize the response time of the measurement system. The components of the pump that contact the gas stream shall be constructed of stainless steel or Teflon. The sample pump must be heated to prevent condensation.

2.1.5 Sample Flow Rate Control. A sample flow rate control valve and rotameter, or equivalent, to maintain a constant sampling rate within 10 percent. The flow rate control valve and rotameter must be heated to prevent condensation. A control valve may also be located on the sample pump bypass loop to assist in controlling the sample pressure and flow rate.

2.1.6 Sample Gas Manifold. Capable of diverting a portion of the sample gas stream to the flame ionization analyzer (FIA), and the remainder to the bypass discharge vent. The manifold components shall be constructed of stainless steel or Teflon. If captured or fugitive emissions are to be measured at multiple locations, the measurement system shall be designed to use separate sampling probes, lines, and pumps for each measurement location and a common sample gas manifold and FIA. The sample gas manifold and connecting lines to the FIA must be heated to prevent condensation.

2.1.7 Organic Concentration Analyzer. An FIA with a span value of 1.5 times the expected concentration as propane; however, other span values may be used if it can be demonstrated that they would provide more accurate measurements. The system shall be capable of meeting or exceeding the following specifications:

2.1.7.1 Zero Drift. Less than ±3.0 percent of the span value.

2.1.7.2 Calibration Drift. Less than ±3.0 percent of the span value.

2.1.7.3 Calibration Error. Less than ±5.0 percent of the calibration gas value.

2.1.7.4 Response Time. Less than 30 seconds.

2.1.8 Integrator/Data Acquisition System. An analog or digital device or computerized data acquisition system used to integrate the FIA response or compute the average response and record measurement data. The minimum data sampling frequency for computing average or integrated values is one measurement value every 5 seconds. The device shall be capable of recording average values at least once per minute.

2.1.9 Calibration and Other Gases. Gases used for calibration, fuel, and combustion air (if required) are contained in compressed gas cylinders. All calibration gases shall be traceable to NIST standards and shall be certified by the manufacturer to ±1 percent of the tag value. Additionally, the manufacturer of the cylinder should provide a recommended shelf life for each calibration gas cylinder over which the concentration does not change more than ±2 percent from the certified value. For calibration gas values not generally available, alternative methods for preparing calibration gas mixtures, such as dilution systems, may be used with prior approval.

2.1.9.1 Fuel. A 40 percent H_2/60 percent He or 40 percent H_2/60 percent N_2 gas mixture is recommended to avoid an oxygen synergism effect that reportedly occurs when oxygen concentration varies significantly from a mean value.

2.1.9.2 Carrier Gas. High purity air with less than 1 ppm of organic material (as propane or carbon equivalent) or less than 0.1 percent of the span value, whichever is greater.

2.1.9.3 FIA Linearity Calibration Gases. Low-, mid-, and high-range gas mixture standards with nominal propane concentrations of 20-30, 45-55, and 70-80 percent of the span value in air, respectively. Other calibration values and other span values may be used if it can be shown that more accurate measurements would be achieved.

2.1.10 Particulate Filter. An in-stack or an out-of-stack glass fiber filter is recommended if exhaust gas particulate loading is significant. An out-of-stack filter must be heated to prevent any condensation unless it can be demonstrated that no condensation occurs.

2.2 Captured Emissions Volumetric Flow Rate.

2.2.1 Method 2 or 2A Apparatus. For determining volumetric flow rate.

2.2.2 Method 3 Apparatus and Reagents. For determining molecular weight of the gas stream. An estimate of the molecular weight of the gas stream may be used if it can be justified.

2.2.3 Method 4 Apparatus and Reagents. For determining moisture content, if necessary.

3. DETERMINATION OF VOLUMETRIC FLOW RATE OF CAPTURED EMISSIONS

3.1 Locate all points where emissions are captured from the affected facility. Using Method 1, determine the sampling points. Be sure to check each site for cyclonic or swirling flow.

3.2 Measure the velocity at each sampling site at least once every hour during each sampling run using Method 2 or 2A.

4. DETERMINATION OF VOC CONTENT OF CAPTURED EMISSIONS

4.1 Analysis Duration. Measure the VOC responses at each captured emissions point during the entire test run or, if applicable, while the process is operating. If there are multiple captured emission locations, design a sampling system to allow a single FIA to be used to determine the VOC responses at all sampling locations.

4.2 Gas VOC Concentration.

4.2.1 Assemble the sample train as shown in Figure 1. Calibrate the FIA according to the procedure in Section 5.1.

4.2.2 Conduct a system check according to the procedure in Section 5.3.

4.2.3 Install the sample probe so that the probe is centrally located in the stack, pipe, or duct, and is sealed tightly at the stack port connection.

4.2.4 Inject zero gas at the calibration valve assembly. Allow the measurement system response to reach zero. Measure the system response time as the time required for the system to reach the effluent concentration after the calibration valve has been returned to the effluent sampling position.

4.2.5 Conduct a system check before and a system drift check after each sampling run according to the procedures in Sections 5.2 and 5.3. If the drift check following a run indicates unacceptable performance, the run is not valid. The tester may elect to perform system drift checks during the run not to exceed one drift check per hour.

4.2.6 Verify that the sample lines, filter, and pump temperatures are 120 ± 5°C.

4.2.7 Begin sampling at the start of the test period and continue to sample during the entire run. Record the starting and ending times and any required process information as appropriate. If multiple captured emission locations are sampled using a single FIA, sample at each location for the same amount of time (e.g., 2 minutes) and continue to switch from one location to another for the entire test run. Be sure that total sampling time at each location is the same at the end of the test run. Collect at least 4 separate measurements from each sample point during each hour of testing. Disregard the measurements at each sampling location until two times the response time of the measurement system has elapsed. Continue sampling for at least I minute and record the concentration measurements.

4.3 Background Concentration.

4.3.1 Locate all NDO's of the TTE. A sampling point shall be centrally located outside of the TTE at 4 equivalent diameters from each NDO, if possible. If there are more than 6 NDO's, choose 6 sampling points evenly spaced among the NDO's.

4.3.2 Assemble the sample train as shown in Figure 2. Calibrate the FIA and conduct a system check according to the procedures in Sections 5.1 and 5.3. **NOTE:** This sample train shall be a separate sampling train from the one to measure the captured emissions.

4.3.3 Position the probe at the sampling location.

4.3.4 Determine the response time, conduct the system check and sample according to the procedures described in Sections 4.2.4 to 4.2.7.

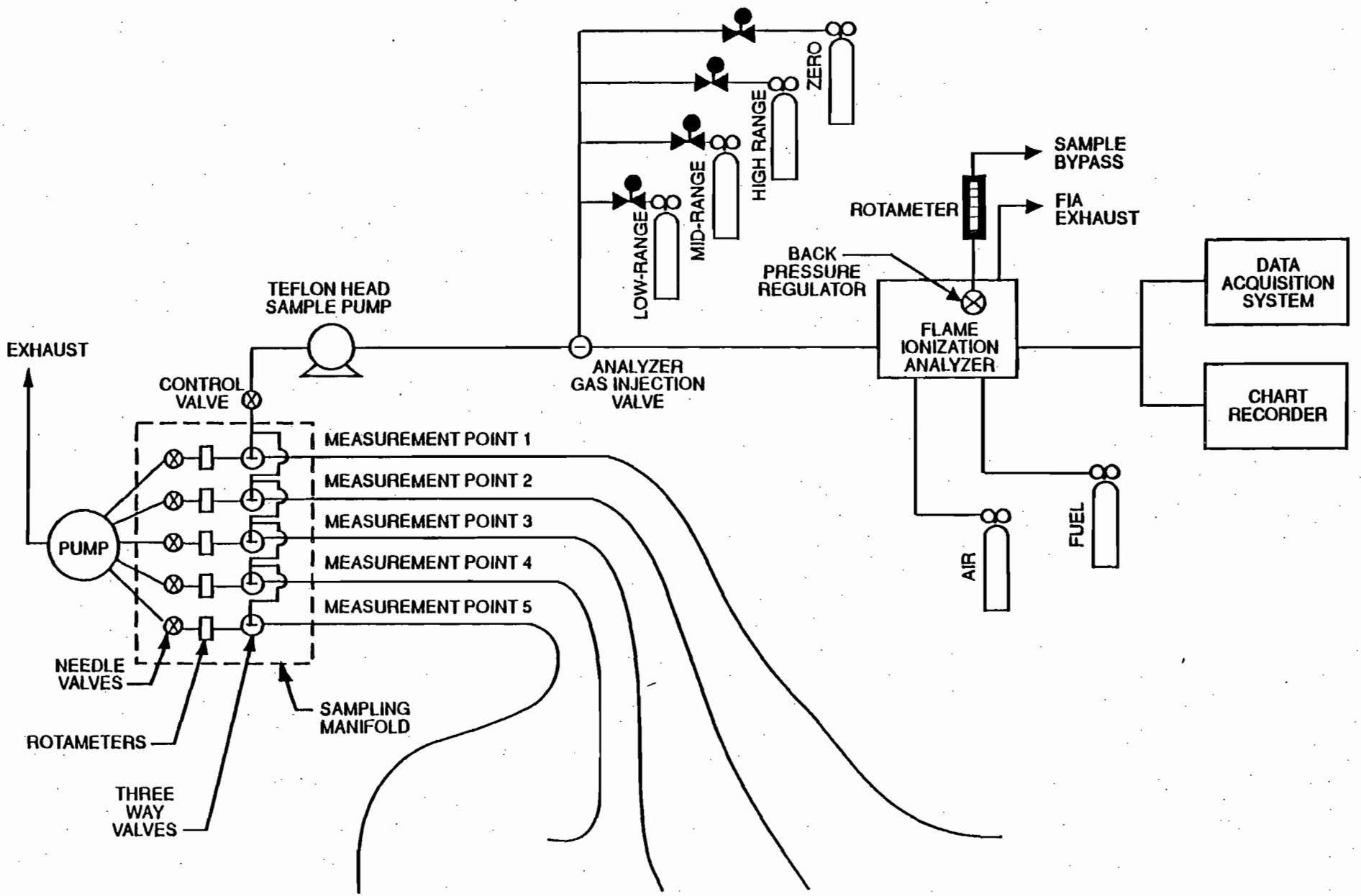


Figure 2. Background measurement system.

4.4 Alternative Procedure. The direct interface sampling and analysis procedure described in Section 7.2 of Method 18 may be used to determine the gas VOC concentration. The system must be designed to collect and analyze at least one sample every 10 minutes.

5. CALIBRATION AND QUALITY ASSURANCE

5.1 FIA Calibration and Linearity Check. Make necessary adjustments to the air and fuel supplies for the FIA and ignite the burner. Allow the FIA to warm up for the period recommended by the manufacturer. Inject a calibration gas into the measurement system and adjust the back-pressure regulator to the value required to achieve the flow rates specified by the manufacturer. Inject the zero- and the high-range calibration gases and adjust the analyzer calibration to provide the proper responses. Inject the low- and mid-range gases and record the responses of the measurement system. The calibration and linearity of the system are acceptable if the responses for all four gases are within 5 percent of the respective gas values. If the performance of the system is not acceptable, repair or adjust the system and repeat the linearity check. Conduct a calibration and linearity check after assembling the analysis system and after a major change is made to the system.

5.2 Systems Drift Checks. Select the calibration gas that most closely approximates the concentration of the captured emissions for conducting the drift checks. Introduce the zero and calibration gas at the calibration valve assembly and verify that the appropriate gas flow rate and pressure are present at the FIA. Record the measurement system responses to the zero and calibration gases. The performance of the system is acceptable if the difference between the drift check measurement and the value obtained in Section 5.1 is less than 3 percent of the span value. Conduct the system drift checks at the end of each run.

5.3 System Check. Inject the high range calibration gas at the inlet of the sampling probe and record the response. The performance of the system is acceptable if the measurement system response is within 5 percent of the value obtained in Section 5.1 for the high range calibration gas. Conduct a system check before and after each test run.

5.4 Analysis Audit. Immediately before each test analyze an audit cylinder as described in Section 5.2. The analysis audit must agree with the audit cylinder concentration within 10 percent.

6. NOMENCLATURE

A_i = area of NDO i, ft^2.

A_N = total area of all NDO's in the enclosure, ft^2.

C_{Bi} = corrected average VOC concentration of background emissions at point i, ppm propane.

C_B = average background concentration, ppm propane.

C_{Gj} = corrected average VOC concentration of captured emissions at point j, ppm propane.

C_{DH} = average measured concentration for the drift check calibration gas, ppm propane.

C_{DO} = average system drift check concentration for zero concentration gas, ppm propane.

C_H = actual concentration of the drift check calibration gas, ppm propane.

C_i = uncorrected average background VOC concentration measured at point i, ppm propane.

C_j = uncorrected average VOC concentration measured at point j, ppm propane.

G = total VOC content of captured emissions, kg.

K_1 = 1.830×10^{-6} kg/(m^3-ppm).

n = number of measurement points.

Q_{Gj} = average effluent volumetric flow rate corrected to standard conditions at captured emissions point j, m^3/min.

θ_C = total duration of captured emissions sampling run, min.

7. CALCULATIONS

7.1 Total VOC Captured Emissions.

$$G = \sum_{j=1}^{n} (C_{Gj} - C_B)\ Q_{Gj}\ \theta_C\ K_1 \qquad \text{Eq. 1}$$

7.2 VOC Concentration of the Captured Emissions at Point j.

$$C_{Gj} = (C_j - C_{DO})\ \frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 2}$$

7.3 Background VOC Concentration at Point i.

$$C_{Bi} = (C_i - C_{DO}) \frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 3}$$

7.4 Average Background Concentration.

$$C_B = \frac{\sum_{i=1}^{n} C_{Bi} A_i}{n A_N} \qquad \text{Eq. 4}$$

NOTE: If the concentration at each point is within 20 percent of the average concentration of all points, the terms "A_i" and "A_N" may be deleted from Equation 4.

March 13, 1990

VOC CAPTURE EFFICIENCY
Procedure G.2 - Captured VOC Emissions (Dilution Technique)

1. INTRODUCTION

1.1 Applicability. This procedure is applicable for determining the volatile organic compounds (VOC) content of captured gas streams. It is intended to be used as a segment in the development of a gas/gas protocol in which fugitive emissions are measured for determining VOC capture efficiency (CE) for surface coating and printing operations. A dilution system is used to reduce the VOC concentration of the captured emission to about the same concentration as the fugitive emissions. The procedure may not be acceptable in certain site-specific situations, e.g., when: (1) direct fired heaters or other circumstances affect the quantity of VOC at the control device inlet; and (2) particulate organic aerosols are formed in the process and are present in the captured emissions.

1.2 Principle. The amount of VOC captured (G) is calculated as the sum of the products of the VOC content (C_{Gj}), the flow rate (Q_{Gj}), and the sampling time (θ_C) from each captured emissions point.

1.3 Estimated Measurement Uncertainty. The measurement uncertainties are estimated for each captured or fugitive emissions point as follows: Q_{Gj} = ±5.5 percent and C_{Gj} = ±5 percent. Based on these numbers, the probable uncertainty for G is estimated at about ±7.4 percent.

1.4 Sampling Requirements. A capture efficiency test shall consist of at least three sampling runs. The sampling time for each run should be at least 8 hours, unless otherwise approved.

1.5 Notes. Because this procedure is often applied in highly explosive areas, caution and care should be exercised in choosing appropriate equipment and installing and using the equipment. Mention of trade names or company products does not constitute endorsement. All gas concentrations (percent, ppm) are by volume, unless otherwise noted.

2. APPARATUS AND REAGENTS

2.1 Gas VOC Concentration. A schematic of the measurement system is shown in Figure 1. The main components are described below:

2.1.1 Dilution System. A Kipp in-stack dilution probe and controller or similar device may be used. The dilution rate may be changed by substituting different critical orifices or adjustments of the aspirator supply pressure. The dilution system shall be heated to prevent VOC condensation. **Note:** An out-of-stack dilution device may be used.

2.1.2 Calibration Valve Assembly. Three-way valve assembly at the outlet of sample probe to direct the zero and calibration gases to the analyzer.

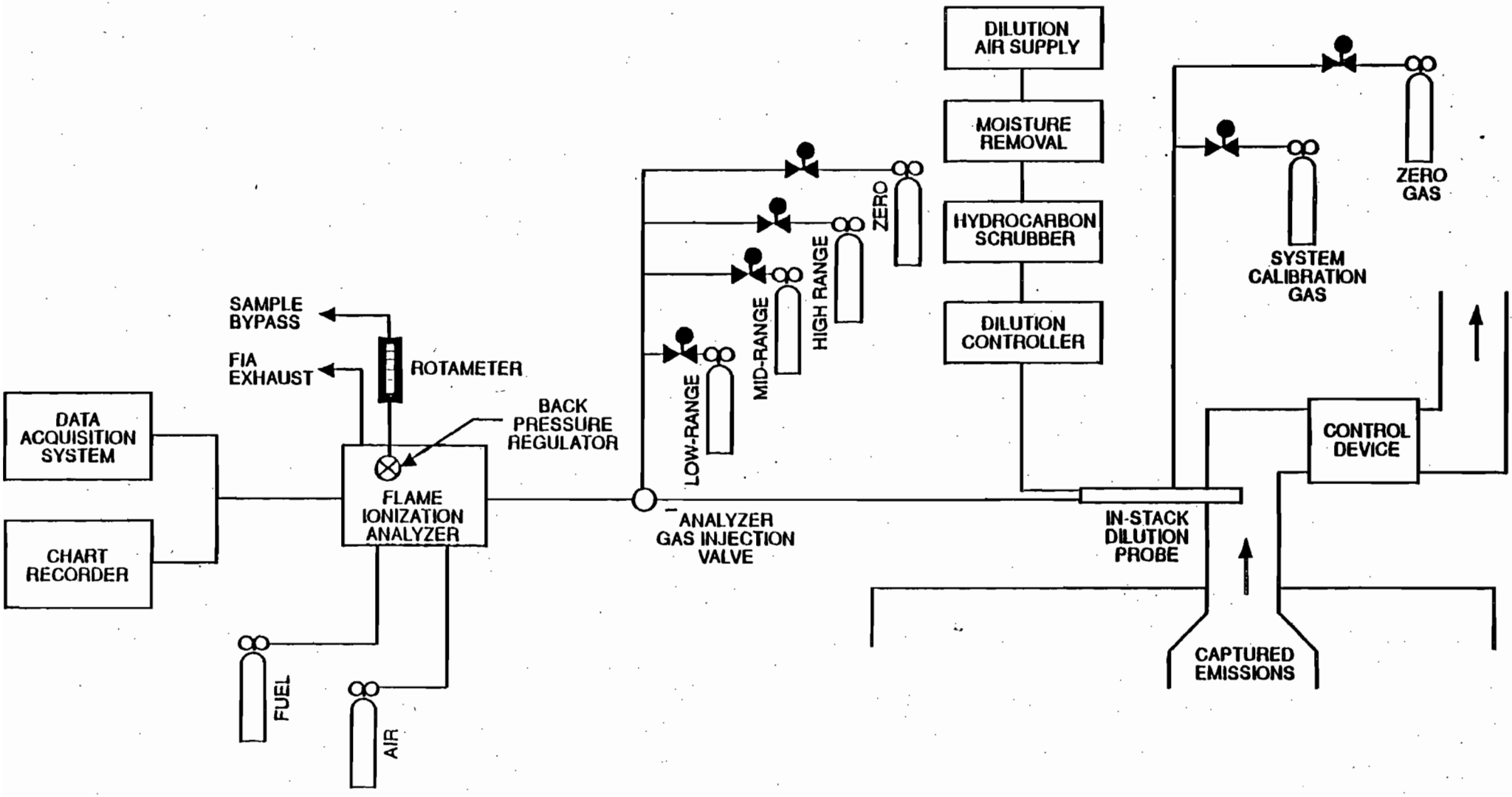


Figure 1. Captured emissions measurement system.

Other methods, such as quick-connect lines, to route calibration gases to the outlet of the sample probe are acceptable.

2.1.3 Sample Line. Stainless steel or Teflon tubing to transport the sample gas to the analyzer. The sample line must be heated to prevent condensation.

2.1.4 Sample Pump. A leak-free pump, to pull the sample gas through the system at a flow rate sufficient to minimize the response time of the measurement system. The components of the pump that contact the gas stream shall be constructed of stainless steel or Teflon. The sample pump must be heated to prevent condensation.

2.1.5 Sample Flow Rate Control. A sample flow rate control valve and rotameter, or equivalent, to maintain a constant sampling rate within 10 percent. The flow control valve and rotameter must be heated to prevent condensation. A control valve may also be located on the sample pump bypass loop to assist in controlling the sample pressure and flow rate.

2.1.6 Sample Gas Manifold. Capable of diverting a portion of the sample gas stream to the flame ionization analyzer (FIA), and the remainder to the bypass discharge vent. The manifold components shall be constructed of stainless steel or Teflon. If captured or fugitive emissions are to be measured at multiple locations, the measurement system shall be designed to use separate sampling probes, lines, and pumps for each measurement location and a common sample gas manifold and FIA. The sample gas manifold and connecting lines to the FIA must be heated to prevent condensation.

2.1.7 Organic Concentration Analyzer. An FIA with a span value of 1.5 times the expected concentration as propane; however, other span values may be used if it can be demonstrated that they would provide more accurate measurements. The system shall be capable of meeting or exceeding the following specifications:

2.1.7.1 Zero Drift. Less than ±3.0 percent of the span value.

2.1.7.2 Calibration Drift. Less than ±3.0 percent of the span value.

2.1.7.3 Calibration Error. Less than ±5.0 percent of the calibration gas value.

2.1.7.4 Response Time. Less than 30 seconds.

2.1.8 Integrator/Data Acquisition System. An analog or digital device or computerized data acquisition system used to integrate the FIA response or compute the average response and record measurement data. The minimum data sampling frequency for computing average or integrated values is one measurement value every 5 seconds. The device shall be capable of recording average values at least once per minute.

2.1.9 Calibration and Other Gases. Gases used for calibration, fuel, and combustion air (if required) are contained in compressed gas cylinders. All calibration gases shall be traceable to NIST standards and shall be certified

by the manufacturer to ±1 percent of the tag value. Additionally, the manufacturer of the cylinder should provide a recommended shelf life for each calibration gas cylinder over which the concentration does not change more than ±2 percent from the certified value. For calibration gas values not generally available, alternative methods for preparing calibration gas mixtures, such as dilution systems, may be used with prior approval.

2.1.9.1 Fuel. A 40 percent H_2/60 percent He or 40 percent H_2/60 percent N_2 gas mixture is recommended to avoid an oxygen synergism effect that reportedly occurs when oxygen concentration varies significantly from a mean value.

2.1.9.2 Carrier Gas and Dilution Air Supply. High purity air with less than 1 ppm of organic material (as propane or carbon equivalent) or less than 0.1 percent of the span value, whichever is greater.

2.1.9.3 FIA Linearity Calibration Gases. Low-, mid-, and high-range gas mixture standards with nominal propane concentrations of 20-30, 45-55, and 70-80 percent of the span value in air, respectively. Other calibration values and other span values may be used if it can be shown that more accurate measurements would be achieved.

2.1.9.4 Dilution Check Gas. Gas mixture standard containing propane in air, approximately half the span value after dilution.

2.1.10 Particulate Filter. An in-stack or an out-of-stack glass fiber filter is recommended if exhaust gas particulate loading is significant. An out-of-stack filter must be heated to prevent any condensation unless it can be demonstrated that no condensation occurs.

2.2 Captured Emissions Volumetric Flow Rate.

2.2.1 Method 2 or 2A Apparatus. For determining volumetric flow rate.

2.2.2 Method 3 Apparatus and Reagents. For determining molecular weight of the gas stream. An estimate of the molecular weight of the gas stream may be used if it can be justified.

2.2.3 Method 4 Apparatus and Reagents. For determining moisture content, if necessary.

3. DETERMINATION OF VOLUMETRIC FLOW RATE OF CAPTURED EMISSIONS

3.1 Locate all points where emissions are captured from the affected facility. Using Method 1, determine the sampling points. Be sure to check each site for cyclonic or swirling flow.

3.2 Measure the velocity at each sampling site at least once every hour during each sampling run using Method 2 or 2A.

4. DETERMINATION OF VOC CONTENT OF CAPTURED EMISSIONS

4.1 Analysis Duration. Measure the VOC responses at each captured emissions point during the entire test run or, if applicable, while the process is operating. If there are a multiple captured emissions locations, design a sampling system to allow a single FIA to be used to determine the VOC responses at all sampling locations.

4.2 Gas VOC Concentration.

4.2.1 Assemble the sample train as shown in Figure 1. Calibrate the FIA according to the procedure in Section 5.1.

4.2.2 Set the dilution ratio and determine the dilution factor according to the procedure in Section 5.3.

4.2.3 Conduct a system check according to the procedure in Section 5.4.

4.2.4 Install the sample probe so that the probe is centrally located in the stack, pipe, or duct, and is sealed tightly at the stack port connection.

4.2.5 Inject zero gas at the calibration valve assembly. Measure the system response time as the time required for the system to reach the effluent concentration after the calibration valve has been returned to the effluent sampling position.

4.2.6 Conduct a system check before and a system drift check after each sampling run according to the procedures in Sections 5.2 and 5.4. If the drift check following a run indicates unacceptable performance, the run is not valid. The tester may elect to perform system drift checks during the run not to exceed one drift check per hour.

4.2.7 Verify that the sample lines, filter, and pump temperatures are 120 ± 5°C.

4.2.8 Begin sampling at the start of the test period and continue to sample during the entire run. Record the starting and ending times and any required process information as appropriate. If multiple captured emission locations are sampled using a single FIA, sample at each location for the same amount of time (e.g., 2 minutes) and continue to switch from one location to another for the entire test run. Be sure that total sampling time at each location is the same at the end of the test run. Collect at least 4 separate measurements from each sample point during each hour of testing. Disregard the measurements at each sampling location until two times the response time of the measurement system has elapsed. Continue sampling for at least 1 minute and record the concentration measurements.

4.3 Background Concentration.

4.3.1 Locate all NDO's of the TTE. A sampling point shall be centrally located outside of the TTE at 4 equivalent diameters from each NDO, if possible. If there are more than 6 NDO's, choose 6 sampling points evenly spaced among the NDO's.

4.3.2 Assemble the sample train as shown in Figure 2. Calibrate the FIA and conduct a system check according to the procedures in Sections 5.1 and 5.4.

4.3.3 Position the probe at the sampling location.

4.3.4 Determine the response time, conduct the system check and sample according to the procedures described in Sections 4.2.4 to 4.2.8.

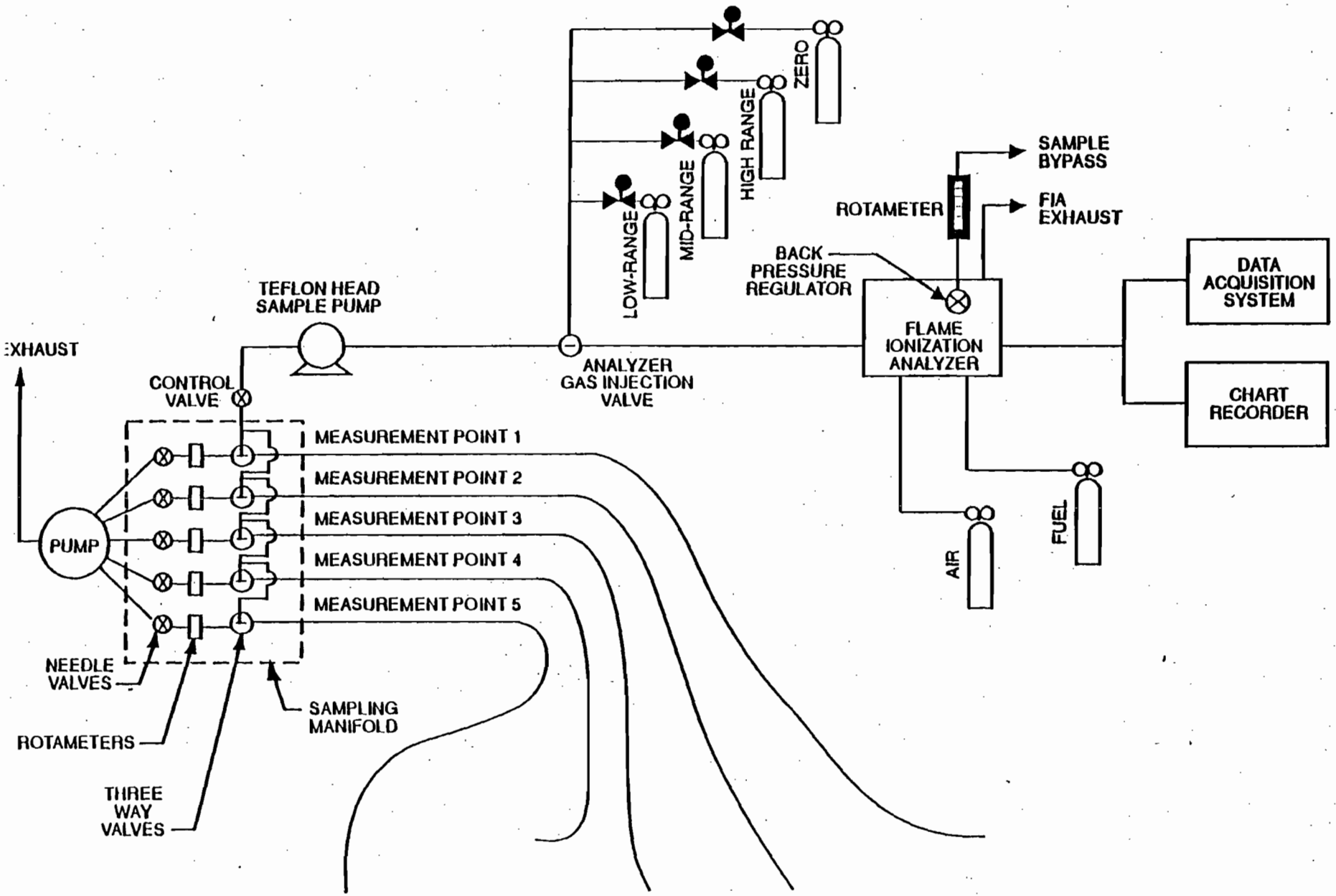
4.4 Alternative Procedure. The direct interface sampling and analysis procedure described in Section 7.2 of Method 18 may be used to determine the gas VOC concentration. The system must be designed to collect and analyze at least one sample every 10 minutes.

5. CALIBRATION AND QUALITY ASSURANCE

5.1 FIA Calibration and Linearity Check. Make necessary adjustments to the air and fuel supplies for the FIA and ignite the burner. Allow the FIA to warm up for the period recommended by the manufacturer. Inject a calibration gas into the measurement system after the dilution system and adjust the back-pressure regulator to the value required to achieve the flow rates specified by the manufacturer. Inject the zero- and the high-range calibration gases and adjust the analyzer calibration to provide the proper responses. Inject the low- and mid-range gases and record the responses of the measurement system. The calibration and linearity of the system are acceptable if the responses for all four gases are within 5 percent of the respective gas values. If the performance of the system is not acceptable, repair or adjust the system and repeat the linearity check. Conduct a calibration and linearity check after assembling the analysis system and after a major change is made to the system.

5.2 Systems Drift Checks. Select the calibration gas that most closely approximates the concentration of the diluted captured emissions for conducting the drift checks. Introduce the zero and calibration gas at the calibration valve assembly and verify that the appropriate gas flow rate and pressure are present at the FIA. Record the measurement system responses to the zero and calibration gases. The performance of the system is acceptable if the difference between the drift check measurement and the value obtained in Section 5.1 is less than 3 percent of the span value. Conduct the system drift check at the end of each run.

5.3 Determination of Dilution Factor. Inject the dilution check gas into the measurement system before the dilution system and record the response. Calculate the dilution factor using Equation 3.


ZERO
HIGH RANGE
MID-RANGE
LOW-RANGE
SAMPLE BYPASS
ROTAMETER
FIA EXHAUST
BACK PRESSURE REGULATOR
DATA ACQUISITION SYSTEM
FLAME IONIZATION ANALYZER
CHART RECORDER
TEFLON HEAD SAMPLE PUMP
EXHAUST
CONTROL VALVE
ANALYZER GAS INJECTION VALVE
MEASUREMENT POINT 1
MEASUREMENT POINT 2
MEASUREMENT POINT 3
MEASUREMENT POINT 4
MEASUREMENT POINT 5
PUMP
AIR
FUEL
NEEDLE VALVES
ROTAMETERS
THREE WAY VALVES
SAMPLING MANIFOLD

5.4 System Check. Inject the high range calibration gas at the inlet to the sampling probe while the dilution air is turned off. Record the response. The performance of the system is acceptable if the measurement system response is within 5 percent of the value obtained in Section 5.1 for the high range calibration gas. Conduct a system check before and after each test run.

5.5 Analysis Audit. Immediately before each test analyze an audit cylinder as described in Section 5.2. The analysis audit must agree with the audit cylinder concentration within 10 percent.

6. NOMENCLATURE

A_i = area of NDO i, ft^2.

A_N = total area of all NDO's in the enclosure, ft^2.

C_A = actual concentration of the dilution check gas, ppm propane.

C_{Bi} = corrected average VOC concentration of background emissions at point i, ppm propane.

C_B = average background concentration, ppm propane.

C_{DH} = average measured concentration for the drift check calibration gas, ppm propane.

C_{DO} = average system drift check concentration for zero concentration gas, ppm propane.

C_H = actual concentration of the drift check calibration gas, ppm propane.

C_i = uncorrected average background VOC concentration measured at point i, ppm propane.

C_j = uncorrected average VOC concentration measured at point j, ppm propane.

C_M = measured concentration of the dilution check gas, ppm propane.

DF = dilution factor.

G = total VOC content of captured emissions, kg.

K_1 = 1.830×10^{-6} kg/(m^3-ppm).

n = number of measurement points.

Q_{Gj} = average effluent volumetric flow rate corrected to standard conditions at captured emissions point j, m^3/min.

θ_C = total duration of capture efficiency sampling run, min.

7. CALCULATIONS

7.1 Total VOC Captured Emissions.

$$G = \sum_{j=1}^{n} C_{Gj}\, Q_{Gj}\, \theta_C\, K_1 \qquad \text{Eq. 1}$$

7.2 VOC Concentration of the Captured Emissions at Point j.

$$C_{Gj} = DF\ (C_j - C_{DO})\ \frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 2}$$

7.3 Dilution Factor.

$$DF = \frac{C_A}{C_M} \qquad \text{Eq. 3}$$

7.4 Background VOC Concentration at Point i.

$$C_{Bi} = (C_i - C_{DO})\ \frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 4}$$

7.5 Average Background Concentration.

$$C_B = \frac{\sum_{i=1}^{n} C_{Bi}\, A_i}{n\, A_N} \qquad \text{Eq. 5}$$

NOTE: If the concentration at each point is within 20 percent of the average concentration of all points, the terms "A_i" and "A_N" may be deleted from Equation 4.

March 13, 1990

VOC CAPTURE EFFICIENCY
Procedure F.1 - Fugitive VOC Emissions from Temporary Enclosures

1. INTRODUCTION

1.1 Applicability. This procedure is applicable for determining the fugitive volatile organic compounds (VOC) emissions from a temporary total enclosure (TTE). It is intended to be used as a segment in the development of liquid/gas or gas/gas protocols for determining VOC capture efficiency (CE) for surface coating and printing operations.

1.2 Principle. The amount of fugitive VOC emissions (F) from the TTE is calculated as the sum of the products of the VOC content (C_{Fj}), the flow rate (Q_{Fj}), and the sampling time (θ_F) from each fugitive emissions point.

1.3 Estimated Measurement Uncertainty. The measurement uncertainties are estimated for each fugitive emission point as follows: Q_{Fj} = ±5.5 percent and CFj = ±5.0 percent. Based on these numbers, the probable uncertainty for F is estimated at about ±7.4 percent.

1.4 Sampling Requirements. A capture efficiency test shall consist of at least three sampling runs. The sampling time for each run should be at least 8 hours, unless otherwise approved.

1.5 Notes. Because this procedure is often applied in highly explosive areas, caution and care should be exercised in choosing appropriate equipment and installing and using the equipment. Mention of trade names or company products does not constitute endorsement. All gas concentrations (percent, ppm) are by volume, unless otherwise noted.

2. APPARATUS AND REAGENTS

2.1 Gas VOC Concentration. A schematic of the measurement system is shown in Figure 1. The main components are described below:

2.1.1 Sample Probe. Stainless steel, or equivalent. The probe shall be heated to prevent VOC condensation.

2.1.2 Calibration Valve Assembly. Three-way valve assembly at the outlet of sample probe to direct the zero and calibration gases to the analyzer. Other methods, such as quick-connect lines, to route calibration gases to the outlet of the sample probe are acceptable.

2.1.3 Sample Line. Stainless steel or Teflon tubing to transport the sample gas to the analyzer. The sample line must be heated to prevent condensation.

2.1.4 Sample Pump. A leak-free pump, to pull the sample gas through the system at a flow rate sufficient to minimize the response time of the measurement system. The components of the pump that contact the gas stream

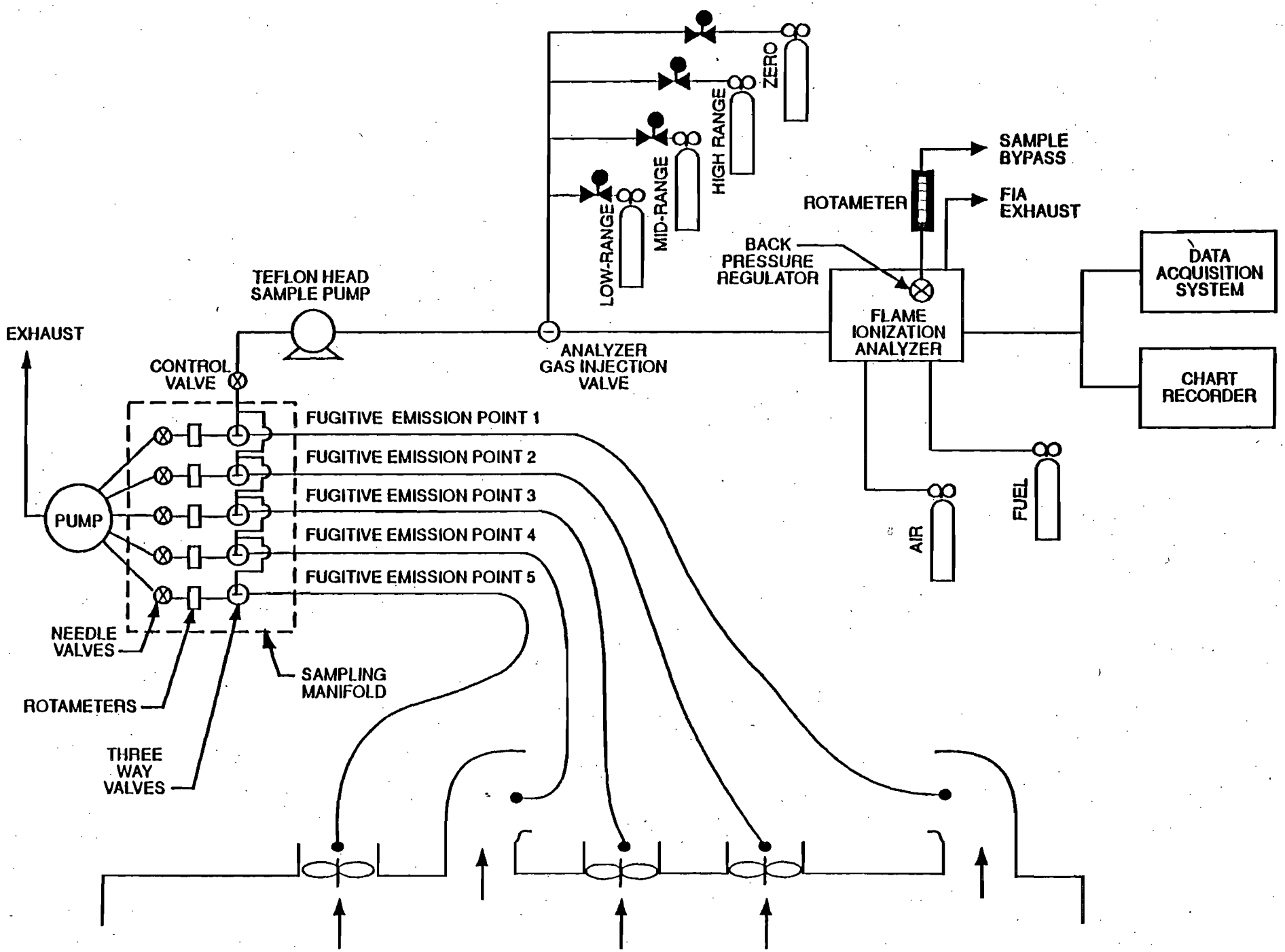


Figure 1. Fugitive emissions measurement system.

shall be constructed of stainless steel or Teflon. The sample pump must be heated to prevent condensation.

2.1.5 Sample Flow Rate Control. A sample flow rate control valve and rotameter, or equivalent, to maintain a constant sampling rate within 10 percent. The flow control valve and rotameter must be heated to prevent condensation. A control valve may also be located on the sample pump bypass loop to assist in controlling the sample pressure and flow rate.

2.1.6 Sample Gas Manifold. Capable of diverting a portion of the sample gas stream to the flame ionization analyzer (FIA), and the remainder to the bypass discharge vent. The manifold components shall be constructed of stainless steel or Teflon. If emissions are to be measured at multiple locations, the measurement system shall be designed to use separate sampling probes, lines, and pumps for each measurement location and a common sample gas manifold and FIA. The sample gas manifold and connecting lines to the FIA must be heated to prevent condensation.

2.1.7 Organic Concentration Analyzer. An FIA with a span value of 1.5 times the expected concentration as propane; however, other span values may be used if it can be demonstrated that they would provide more accurate measurements. The system shall be capable of meeting or exceeding the following specifications:

2.1.7.1 Zero Drift. Less than ±3.0 percent of the span value.

2.1.7.2 Calibration Drift. Less than ±3.0 percent of the span value.

2.1.7.3 Calibration Error. Less than ±5.0 percent of the calibration gas value.

2.1.7.4 Response Time. Less than 30 seconds.

2.1.8 Integrator/Data Acquisition System. An analog or digital device or computerized data acquisition system used to integrate the FIA response or compute the average response and record measurement data. The minimum data sampling frequency for computing average or integrated values is one measurement value every 5 seconds. The device shall be capable of recording average values at least once per minute.

2.1.9 Calibration and Other Gases. Gases used for calibration, fuel, and combustion air (if required) are contained in compressed gas cylinders. All calibration gases shall be traceable to NIST standards and shall be certified by the manufacturer to ±1 percent of the tag value. Additionally, the manufacturer of the cylinder should provide a recommended shelf life for each calibration gas cylinder over which the concentration does not change more than ±2 percent from the certified value. For calibration gas values not generally available, alternative methods for preparing calibration gas mixtures, such as dilution systems, may be used with prior approval.

2.1.9.1 Fuel. A 40 percent H_2/60 percent He or 40 percent H_2/60 percent N_2 gas mixture is recommended to avoid an oxygen synergism effect that reportedly occurs when oxygen concentration varies significantly from a mean value.

2.1.9.2 Carrier Gas. High purity air with less than 1 ppm of organic material (as propane or carbon equivalent) or less than 0.1 percent of the span value, whichever is greater.

2.1.9.3 FIA Linearity Calibration Gases. Low-, mid-, and high-range gas mixture standards with nominal propane concentrations of 20-30, 45-55, and 70-80 percent of the span value in air, respectively. Other calibration values and other span values may be used if it can be shown that more accurate measurements would be achieved.

2.1.10 Particulate Filter. An in-stack or an out-of-stack glass fiber filter is recommended if exhaust gas particulate loading is significant. An out-of-stack filter must be heated to prevent any condensation unless it can be demonstrated that no condensation occurs.

2.2 Fugitive Emissions Volumetric Flow Rate.

2.2.1 Method 2 or 2A Apparatus. For determining volumetric flow rate.

2.2.2 Method 3 Apparatus and Reagents. For determining molecular weight of the gas stream. An estimate of the molecular weight of the gas stream may be used if it can be justified.

2.2.3 Method 4 Apparatus and Reagents. For determining moisture content, if necessary.

2.3 Temporary Total Enclosure. The criteria for designing a TTE are discussed in Procedure T.

3. DETERMINATION OF VOLUMETRIC FLOW RATE OF FUGITIVE EMISSIONS

3.1 Locate all points where emissions are exhausted from the TTE. Using Method 1, determine the sampling points. Be sure to check each site for cyclonic or swirling flow.

3.2 Measure the velocity at each sampling site at least once every hour during each sampling run using Method 2 or 2A.

4. DETERMINATION OF VOC CONTENT OF FUGITIVE EMISSIONS

4.1 Analysis Duration. Measure the VOC responses at each fugitive emission point during the entire test run or, if applicable, while the process is operating. If there are multiple emission locations, design a sampling system to allow a single FIA to be used to determine the VOC responses at all sampling locations.

4.2 Gas VOC Concentration.

4.2.1 Assemble the sample train as shown in Figure 1. Calibrate the FIA and conduct a system check according to the procedures in Sections 5.1 and 5.3, respectively.

4.2.2 Install the sample probe so that the probe is centrally located in the stack, pipe, or duct, and is sealed tightly at the stack port connection.

4.2.3 Inject zero gas at the calibration valve assembly. Allow the measurement system response to reach zero. Measure the system response time as the time required for the system to reach the effluent concentration after the calibration valve has been returned to the effluent sampling position.

4.2.4 Conduct a system check before and a system drift check after each sampling run according to the procedures in Sections 5.2 and 5.3. If the drift check following a run indicates unacceptable performance, the run is not valid. The tester may elect to perform system drift checks during the run not to exceed one drift check per hour.

4.2.5 Verify that the sample lines, filter, and pump temperatures are 120 ± 5°C.

4.2.6 Begin sampling at the start of the test period and continue to sample during the entire run. Record the starting and ending times and any required process information as appropriate. If multiple emission locations are sampled using a single FIA, sample at each location for the same amount of time (e.g., 2 minutes) and continue to switch from one location to another for the entire test run. Be sure that total sampling time at each location is the same at the end of the test run. Collect at least 4 separate measurements from each sample point during each hour of testing. Disregard the response measurements at each sampling location until two times the response time of the measurement system has elapsed. Continue sampling for at least 1 minute and record the concentration measurements.

4.3 Background Concentration.

4.3.1 Determination of VOC Background Concentration.

4.3.1.1 Locate all NDO's of the TTE. A sampling point shall be centrally located outside of the TTE at 4 equivalent diameters from each NDO, if possible. If there are more than 6 NDO's, choose 6 sampling points evenly spaced among the NDO's.

4.3.1.2 Assemble the sample train as shown in Figure 2. Calibrate the FIA and conduct a system check according to the procedures in Sections 5.1 and 5.3.

4.3.1.3 Position the probe at the sampling location.

4.3.1.4 Determine the response time, conduct the system check and sample according to the procedures described in Sections 4.2.3 to 4.2.6.

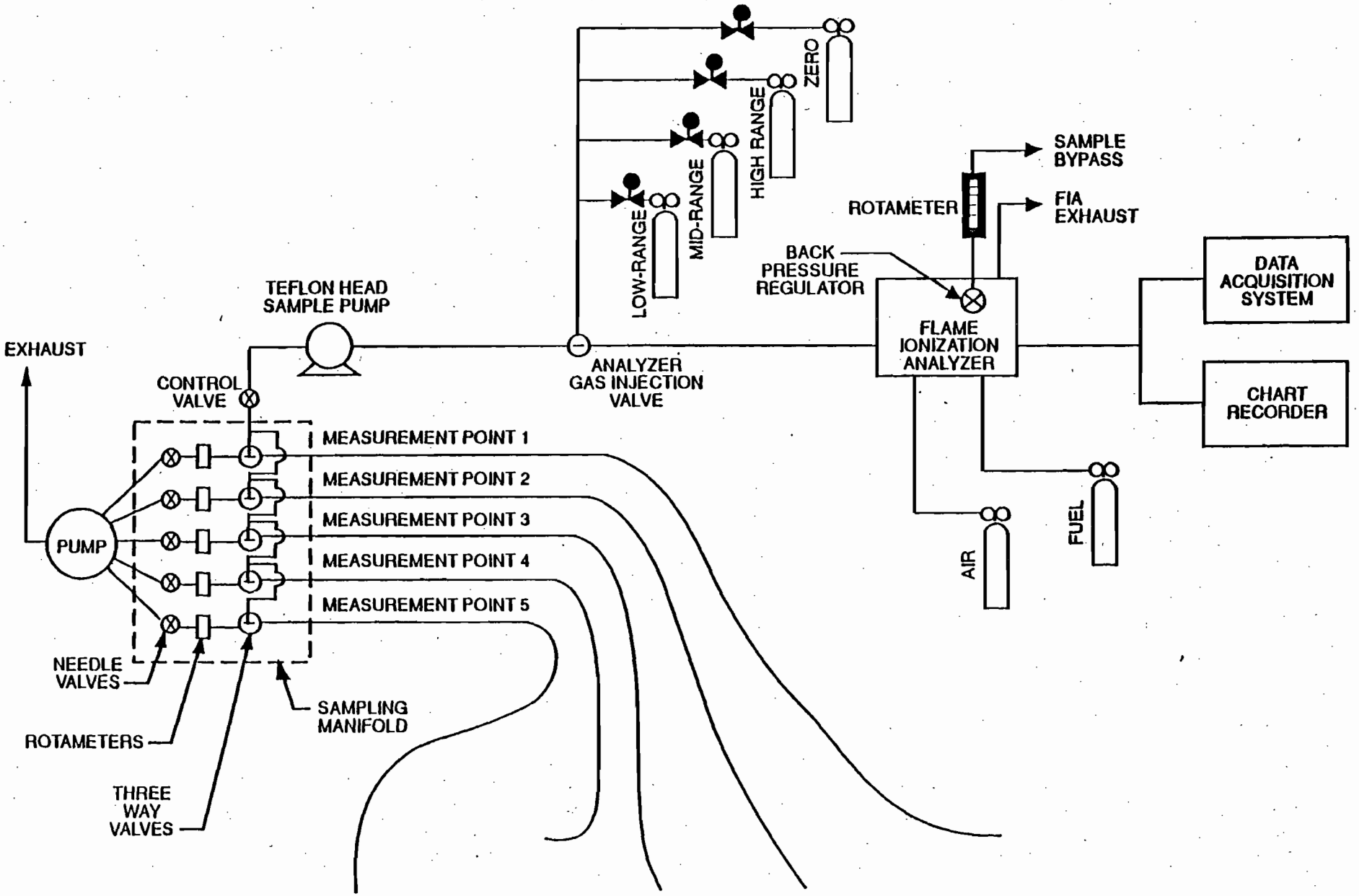


Figure 2. Background measurement system.

4.4 Alternative Procedure. The direct interface sampling and analysis procedure described in Section 7.2 of Method 18 may be used to determine the gas VOC concentration. The system must be designed to collect and analyze at least one sample every 10 minutes.

5. CALIBRATION AND QUALITY ASSURANCE

5.1 FIA Calibration and Linearity Check. Make necessary adjustments to the air and fuel supplies for the FIA and ignite the burner. Allow the FIA to warm up for the period recommended by the manufacturer. Inject a calibration gas into the measurement system and adjust the back-pressure regulator to the value required to achieve the flow rates specified by the manufacturer. Inject the zero- and the high-range calibration gases and adjust the analyzer calibration to provide the proper responses. Inject the low- and mid-range gases and record the responses of the measurement system. The calibration and linearity of the system are acceptable if the responses for all four gases are within 5 percent of the respective gas values. If the performance of the system is not acceptable, repair or adjust the system and repeat the linearity check. Conduct a calibration and linearity check after assembling the analysis system and after a major change is made to the system.

5.2 Systems Drift Checks. Select the calibration gas concentration that most closely approximates that of the fugitive gas emissions to conduct the drift checks. Introduce the zero and calibration gas at the calibration valve assembly and verify that the appropriate gas flow rate and pressure are present at the FIA. Record the measurement system responses to the zero and calibration gases. The performance of the system is acceptable if the difference between the drift check measurement and the value obtained in Section 5.1 is less than 3 percent of the span value. Conduct a system drift check at the end of each run.

5.3 System Check. Inject the high range calibration gas at the inlet of the sampling probe and record the response. The performance of the system is acceptable if the measurement system response is within 5 percent of the value obtained in Section 5.1 for the high range calibration gas. Conduct a system check before each test run.

5.4 Analysis Audit. Immediately before each test analyze an audit cylinder as described in Section 5.2. The analysis audit must agree with the audit cylinder concentration within 10 percent.

6. NOMENCLATURE

A_i = area of NDO i, ft^2.

A_N = total area of all NDO's in the enclosure, ft^2.

C_{Bi} = corrected average VOC concentration of background emissions at point i, ppm propane.

C_B = average background concentration, ppm propane.

C_{DH} = average measured concentration for the drift check calibration gas, ppm propane.

C_{DO} = average system drift check concentration for zero concentration gas, ppm propane.

C_{Fj} = corrected average VOC concentration of fugitive emissions at point j, ppm propane.

C_H = actual concentration of the drift check calibration gas, ppm propane.

C_i = uncorrected average background VOC concentration at point i, ppm propane.

C_j = uncorrected average VOC concentration measured at point j, ppm propane.

F = total VOC content of fugitive emissions, kg.

K_1 = 1.830×10^{-6} kg/(m^3-ppm).

n = number of measurement points.

Q_{Fj} = average effluent volumetric flow rate corrected to standard conditions at fugitive emissions point j, m^3/min.

θ_F = total duration of fugitive emissions sampling run, min.

7. CALCULATIONS

7.1 Total VOC Fugitive Emissions.

$$F = \sum_{j=1}^{n} (C_{Fj} - C_B)\ Q_{Fj}\ \theta_F\ K_1 \qquad \text{Eq. 1}$$

7.2 VOC Concentration of the Fugitive Emissions at Point j.

$$C_{Fj} = (C_j - C_{DO}) \frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 2}$$

7.3 Background VOC Concentration at Point i.

$$C_{Bi} = (C_i - C_{DO}) \frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 3}$$

7.4 Average Background Concentration.

$$C_B = \frac{\sum_{i=1}^{n} C_{Bi} A_i}{n A_N} \qquad \text{Eq. 4}$$

NOTE: If the concentration at each point is within 20 percent of the average concentration of all points, the terms "A_i" and "A_N" may be deleted from Equation 4.

March 13, 1990

VOC CAPTURE EFFICIENCY
Procedure F.2 - Fugitive VOC Emissions from Building Enclosures

1. INTRODUCTION

1.1 Applicability. This procedure is applicable for determining the fugitive volatile organic compounds (VOC) emissions from a building enclosure (BE). It is intended to be used as a segment in the development of liquid/gas or gas/gas protocols for determining VOC capture efficiency (CE) for surface coating and printing operations.

1.2 Principle. The total amount of fugitive VOC emissions (F_B) from the BE is calculated as the sum of the products of the VOC content (C_{Fj}) of each fugitive emissions point, its flow rate (Q_{Fj}), and time (θ_F).

1.3 Measurement Uncertainty. The measurement uncertainties are estimated for each fugitive emissions point as follows: Q_{Fj} = ±5.0 percent and C_{Fj} = ±5.0 percent. Based on these numbers, the probable uncertainty for F_B is estimated at about ±11.2 percent.

1.4 Sampling Requirements. A capture efficiency test shall consist of at least three sampling runs. The sampling time for each run should be at least 8 hours, unless otherwise approved.

1.5 Notes. Because this procedure is often applied in highly explosive areas, caution and care should be exercised in choosing appropriate equipment and installing and using the equipment. Mention of trade names or company products does not constitute endorsement. All gas concentrations (percent, ppm) are by volume, unless otherwise noted.

2. APPARATUS AND REAGENTS

2.1 Gas VOC Concentration. A schematic of the measurement system is shown in Figure 1. The main components are described below:

2.1.1 Sample Probe. Stainless steel, or equivalent. The probe shall be heated to prevent VOC condensation.

2.1.2 Calibration Valve Assembly. Three-way valve assembly at the outlet of sample probe to direct the zero and calibration gases to the analyzer. Other methods, such as quick-connect lines, to route calibration gases to the outlet of the sample probe are acceptable.

2.1.3 Sample Line. Stainless steel or Teflon tubing to transport the sample gas to the analyzer. The sample line must be heated to prevent condensation.

2.1.4 Sample Pump. A leak-free pump, to pull the sample gas through the system at a flow rate sufficient to minimize the response time of the measurement system. The components of the pump that contact the gas stream

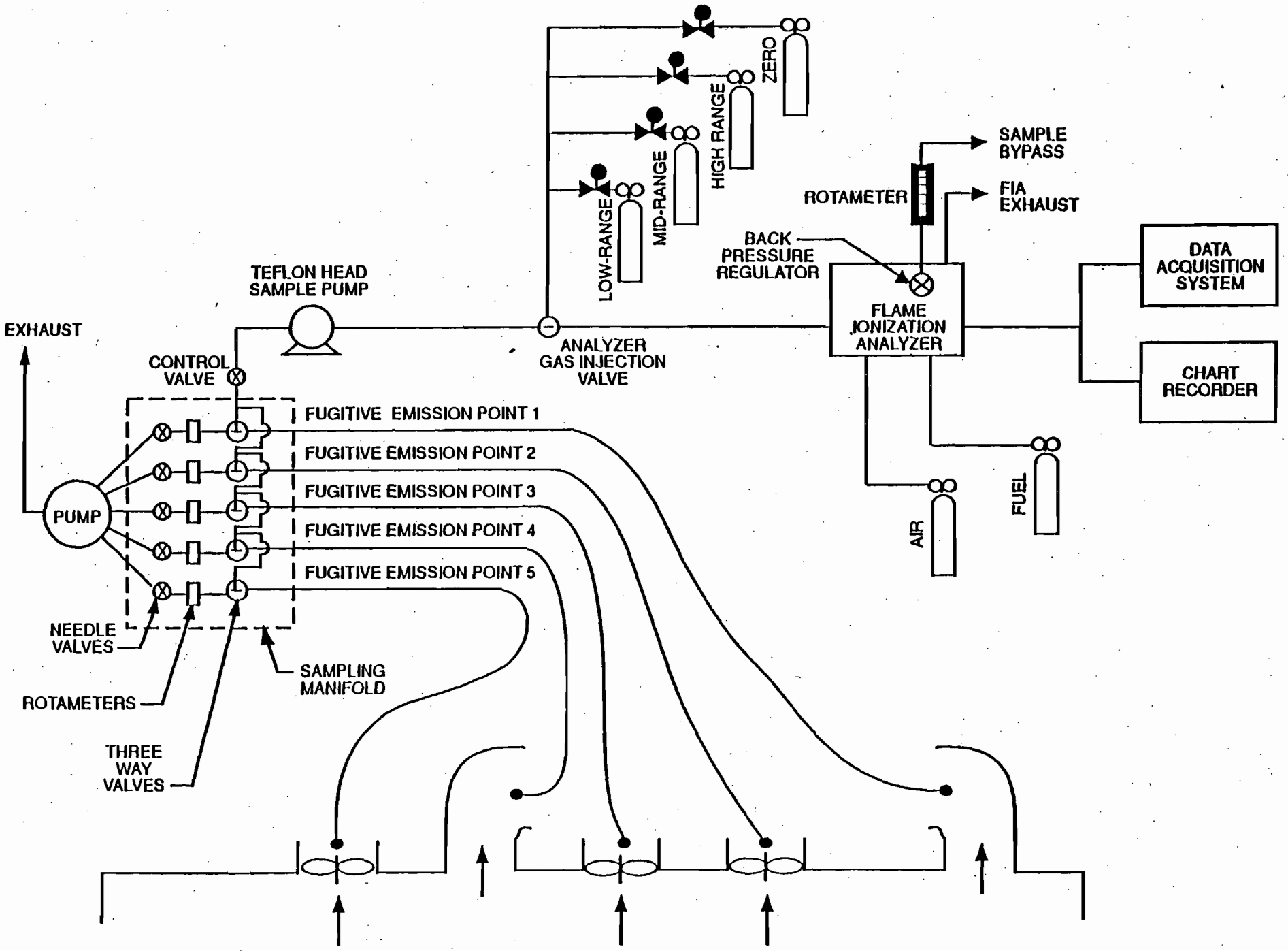


Figure 1. Fugilive emissions measurement system.

shall be constructed of stainless steel or Teflon. The sample pump must be heated to prevent condensation.

2.1.5 Sample Flow Rate Control. A sample flow rate control valve and rotameter, or equivalent, to maintain a constant sampling rate within 10 percent. The flow rate control valve and rotameter must be heated to prevent condensation. A control valve may also be located on the sample pump bypass loop to assist in controlling the sample pressure and flow rate.

2.1.6 Sample Gas Manifold. Capable of diverting a portion of the sample gas stream to the flame ionization analyzer (FIA), and the remainder to the bypass discharge vent. The manifold components shall be constructed of stainless steel or Teflon. If emissions are to be measured at multiple locations, the measurement system shall be designed to use separate sampling probes, lines, and pumps for each measurement location and a common sample gas manifold and FIA. The sample gas manifold must be heated to prevent condensation.

2.1.7 Organic Concentration Analyzer. An FIA with a span value of 1.5 times the expected concentration as propane; however, other span values may be used if it can be demonstrated that they would provide more accurate measurements. The system shall be capable of meeting or exceeding the following specifications:

2.1.7.1 Zero Drift. Less than ±3.0 percent of the span value.

2.1.7.2 Calibration Drift. Less than ±3.0 percent of the span value.

2.1.7.3 Calibration Error. Less than ±5.0 percent of the calibration gas value.

2.1.7.4 Response Time. Less than 30 seconds.

2.1.8 Integrator/Data Acquisition System. An analog or digital device or computerized data acquisition system used to integrate the FIA response or compute the average response and record measurement data. The minimum data sampling frequency for computing average or integrated values is one measurement value every 5 seconds. The device shall be capable of recording average values at least once per minute.

2.1.9 Calibration and Other Gases. Gases used for calibration, fuel, and combustion air (if required) are contained in compressed gas cylinders. All calibration gases shall be traceable to NIST standards and shall be certified by the manufacturer to ±1 percent of the tag value. Additionally, the manufacturer of the cylinder should provide a recommended shelf life for each calibration gas cylinder over which the concentration does not change more than ±2 percent from the certified value. For calibration gas values not generally available, alternative methods for preparing calibration gas mixtures, such as dilution systems, may be used with prior approval.

2.1.9.1 Fuel. A 40 percent H_2/60 percent He or 40 percent H_2/60 percent N_2 gas mixture is recommended to avoid an oxygen synergism effect that reportedly occurs when oxygen concentration varies significantly from a mean value.

2.1.9.2 Carrier Gas. High purity air with less than 1 ppm of organic material (propane or carbon equivalent) or less than 0.1 percent of the span value, whichever is greater.

2.1.9.3 FIA Linearity Calibration Gases. Low-, mid-, and high-range gas mixture standards with nominal propane concentrations of 20-30, 45-55, and 70-80 percent of the span value in air, respectively. Other calibration values and other span values may be used if it can be shown that more accurate measurements would be achieved.

2.1.10 Particulate Filter. An in-stack or an out-of-stack glass fiber filter is recommended if exhaust gas particulate loading is significant. An out-of-stack filter must be heated to prevent any condensation unless it can be demonstrated that no condensation occurs.

2.2 Fugitive Emissions Volumetric Flow Rate.

2.2.1 Flow Direction Indicators. Any means of indicating inward or outward flow, such as light plastic film or paper streamers, smoke tubes, filaments, and sensory perception.

2.2.2 Method 2 or 2A Apparatus. For determining volumetric flow rate. Anemometers or similar devices calibrated according to the manufacturer's instructions may be used when low velocities are present. Vane anemometers (Young-maximum response propeller), specialized pitots with electronic manometers (e.g., Shortridge Instruments Inc., Airdata Multimeter 860) are commercially available with measurement thresholds of 15 and 8 mpm (50 and 25 fpm), respectively.

2.2.3 Method 3 Apparatus and Reagents. For determining molecular weight of the gas stream. An estimate of the molecular weight of the gas stream may be used if it can be justified.

2.2.4 Method 4 Apparatus and Reagents. For determining moisture content, if necessary.

3. DETERMINATION OF VOLUMETRIC FLOW RATE OF FUGITIVE EMISSIONS

3.1 Preliminary Determinations. The purpose of this exercise is to determine which exhaust points should be measured for volumetric flow rates and VOC concentrations.

3.1.1 Forced Draft Openings. Identify all forced draft openings. Determine the volumetric flow rate according to Method 2.

3.1.2 NDO's Exhaust Points. The NDO's in the roof of a facility are considered to be exhaust points. Determine volumetric flow rate from these NDO's. Divide the cross-sectional area according to Method 1 using 12 equal areas. Use the appropriate velocity measurement devices, e.g., propeller anemometers.

3.1.3 Other NDO's.

3.1.3.1 This step is optional. Determine the exhaust flow rate, including that of the control device, from the enclosure and the intake air flow rate. If the exhaust flow rate divided by the intake air flow rate is greater than 1.1, then all other NDO's are not considered to be significant exhaust points.

3.1.3.2 If the option above is not taken, identify all other NDO's and other potential points through which fugitive emissions may escape the enclosure. Then use the following criteria to determine whether flow rates and VOC concentrations need to be measured:

3.1.3.2.1 Using the appropriate flow direction indicator, determine the flow direction. An NDO with zero or inward flow is not an exhaust point.

3.1.3.2.2 Measure the outward volumetric flow rate from the remainder of the NDO's. If the collective flow rate is 2 percent, or less, of the flow rate from Sections 3.1.1 and 3.1.2, then these NDO's, except those within two equivalent diameters (based on NDO opening) from VOC sources, may be considered to be non-exhaust points.

3.1.3.2.3 If the percentage calculated in Section 3.1.3.2.2 is greater than 2 percent, those NDO's (except those within two equivalent diameters from VOC sources) whose volumetric flow rate total 2 percent of the flow rate from Sections 3.1.1 and 3.1.2 may be considered as non-exhaust points. All remaining NDO's shall be measured for volumetric flow rate and VOC concentrations during the CE test.

3.1.3.2.4 The tester may choose to measure VOC concentrations at the forced exhaust points and the NDO's. If the total VOC emissions from the NDO's are less than 2 percent of the emissions from the forced draft and roof NDO's, then these NDO's may be eliminated from further consideration.

3.2 Determination of Flow Rates.

3.2.1 Measure the volumetric flow rate at all locations identified as exhaust points in Section 3.1. Divide each exhaust opening into 9 equal areas for rectangular openings and 8 for circular openings.

3.2.2 Measure the velocity at each site at least once every hour during each sampling run using Method 2 or 2A, if applicable, or using the low velocity instruments in Section 2.2.2.

4. DETERMINATION OF VOC CONTENT OF FUGITIVE EMISSIONS

4.1 Analysis Duration. Measure the VOC responses at each fugitive emission point during the entire test run or, if applicable, while the process is operating. If there are multiple emissions locations, design a sampling system to allow a single FIA to be used to determine the VOC responses at all sampling locations.

4.2 Gas VOC Concentration.

4.2.1 Assemble the sample train as shown in Figure 1. Calibrate the FIA and conduct a system check according to the procedures in Sections 5.1 and 5.3, respectively.

4.2.2 Install the sample probe so that the probe is centrally located in the stack, pipe, or duct, and is sealed tightly at the stack port connection.

4.2.3 Inject zero gas at the calibration valve assembly. Allow the measurement system response to reach zero. Measure the system response time as the time required for the system to reach the effluent concentration after the calibration valve has been returned to the effluent sampling position.

4.2.4 Conduct a system check before and a system drift check after each sampling run according to the procedures in Sections 5.2 and 5.3. If the drift check following a run indicates unacceptable performance, the run is not valid. The tester may elect to perform drift checks during the run not to exceed one drift check per hour.

4.2.5 Verify that the sample lines, filter, and pump temperatures are 120 ± 5°C.

4.2.6 Begin sampling at the start of the test period and continue to sample during the entire run. Record the starting and ending times and any required process information as appropriate. If multiple emission locations are sampled using a single FIA, sample at each location for the same amount of time (e.g., 2 minutes) and continue to switch from one location to another for the entire test run. Be sure that total sampling time at each location is the same at the end of the test run. Collect at least 4 separate measurements from each sample point during each hour of testing. Disregard the response measurements at each sampling location until two times the response time of the measurement system has elapsed. Continue sampling for at least 1 minute and record the concentration measurements.

4.3 Alternative Procedure The direct interface sampling and analysis procedure described in Section 7.2 of Method 18 may be used to determine the gas VOC concentration. The system must be designed to collect and analyze at least one sample every 10 minutes.

5. CALIBRATION AND QUALITY ASSURANCE

5.1 FIA Calibration and Linearity Check. Make necessary adjustments to the air and fuel supplies for the FIA and ignite the burner. Allow the FIA to warm up for the period recommended by the manufacturer. Inject a calibration gas into the measurement system and adjust the back-pressure regulator to the value required to achieve the flow rates specified by the manufacturer. Inject the zero- and the high-range calibration gases and adjust the analyzer calibration to provide the proper responses. Inject the low- and mid-range gases and record the responses of the measurement system. The calibration and linearity of the system are acceptable if the responses for all four gases are

within 5 percent of the respective gas values. If the performance of the system is not acceptable, repair or adjust the system and repeat the linearity check. Conduct a calibration and linearity check after assembling the analysis system and after a major change is made to the system.

5.2 Systems Drift Checks. Select the calibration gas that most closely approximates the concentration of the captured emissions for conducting the drift checks. Introduce the zero and calibration gas at the calibration valve assembly and verify that the appropriate gas flow rate and pressure are present at the FIA. Record the measurement system responses to the zero and calibration gases. The performance of the system is acceptable if the difference between the drift check measurement and the value obtained in Section 5.1 is less than 3 percent of the span value. Conduct a system drift check at the end of each run.

5.3 System Check. Inject the high range calibration gas at the inlet of the sampling probe and record the response. The performance of the system is acceptable if the measurement system response is within 5 percent of the value obtained in Section 5.1 for the high range calibration gas. Conduct a system check before each test run.

5.4 Analysis Audit. Immediately before each test analyze an audit cylinder as described in Section 5.2. The analysis audit must agree with the audit cylinder concentration within 10 percent.

6. NOMENCLATURE

C_{DH} = average measured concentration for the drift check calibration gas, ppm propane.

C_{DO} = average system drift check concentration for zero concentration gas, ppm propane.

C_{Fj} = corrected average VOC concentration of fugitive emissions at point j, ppm propane.

C_H = actual concentration of the drift check calibration gas, ppm propane.

C_j = uncorrected average VOC concentration measured at point j, ppm propane.

F_B = total VOC content of fugitive emissions from the building, kg.

K_1 = 1.830×10^{-6} kg/(m^3-ppm).

n = number of measurement points.

Q_{Fj} = average effluent volumetric flow rate corrected to standard conditions at fugitive emissions point j, m^3/min.

θ_F = total duration of capture efficiency sampling run, min.

7. CALCULATIONS

7.1 Total VOC Fugitive Emissions From the Building.

$$F_B = \sum_{j=1}^{n} C_{Fj}\, Q_{Fj}\, \theta_F\, K_1 \qquad \text{Eq. 1}$$

7.2 VOC Concentration of the Fugitive Emissions at Point j.

$$C_{Fj} = (C_j - C_{DO}) \frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 2}$$

March 13, 1990

VOC CAPTURE EFFICIENCY
Procedure T - Criteria for and Verification of a Permanent or Temporary Total Enclosure

1. INTRODUCTION

1.1 Applicability. This procedure is used to determine whether a permanent or temporary enclosure meets the criteria of a total enclosure.

1.2 Principle. An enclosure is evaluated against a set of criteria. If the criteria are met and if all the exhaust gases are ducted to a control device, then the volatile organic compounds (VOC) capture efficiency (CE) is assumed to be 100 percent and CE need not be measured. However, if part of the exhaust gas stream is not ducted to a control device, CE must be determined.

2. DEFINITIONS

2.1 Natural Draft Opening (NDO) -- Any permanent opening in the enclosure that remains open during operation of the facility and is not connected to a duct in which a fan is installed.

2.2 Permanent Total Enclosure (PTE) -- A permanently installed enclosure that completely surrounds a source of emissions such that all VOC emissions are captured and contained for discharge through a control device.

2.3 Temporary Total Enclosure (TTE) -- A temporarily installed enclosure that completely surrounds a source of emissions such that all VOC emissions are captured and contained for discharge through ducts that allow for the accurate measurement of VOC rates.

3. CRITERIA OF A TEMPORARY TOTAL ENCLOSURE

3.1 Any NDO shall be at least 4 equivalent opening diameters from each VOC emitting point.

3.2 Any exhaust point from the enclosure shall be at least 4 equivalent duct or hood diameters from each NDO.

3.3 The total area of all NDO's shall not exceed 5 percent of the surface area of the enclosure's four walls, floor, and ceiling.

3.4 The average facial velocity (FV) of air through all NDO's shall be at least 3,600 m/hr (200 fpm). The direction of air through all NDO's shall be into the enclosure.

3.5 All access doors and windows whose areas are not included in Section 3.3 and are not included in the calculation in Section 3.4 shall be closed during routine operation of the process.

4. CRITERIA OF A PERMANENT TOTAL ENCLOSURE

4.1 Same as Sections 3.1 and 3.3 - 3.5.

4.2 All VOC emissions must be captured and contained for discharge through a control device.

5. PROCEDURE

5.1 Determine the equivalent diameters of the NDO's and determine the distances from each VOC emitting point to all NDO's. Determine the equivalent diameter of each exhaust duct or hood and its distance to all NDO's. Calculate the distances in terms of equivalent diameters. The number of equivalent diameters shall be at least 4.

5.2 Measure the total area (A_t) of the enclosure and the total area (A_N) of all NDO's of the enclosure. Calculate the NDO to enclosure area ratio (NEAR) as follows:

$$NEAR = A_N/A_t$$

The NEAR must be ≤ 0.05.

5.3 Measure the volumetric flow rate, corrected to standard conditions, of each gas stream exiting the enclosure through an exhaust duct or hood using EPA Method 2. In some cases (e.g., when the building is the enclosure), it may be necessary to measure the volumetric flow rate, corrected to standard conditions, of each gas stream entering the enclosure through a forced makeup air duct using Method 2. Calculate FV using the following equation:

$$FV = [Q_O - Q_I]/ A_N$$

where:

Q_O = the sum of the volumetric flow from all gas streams exiting the enclosure through an exhaust duct or hood.

Q_I = the sum of the volumetric flow from all gas streams into the enclosure through a forced makeup air duct; zero, if there is no forced makeup air into the enclosure.

A_N = total area of all NDO's in enclosure.

The FV shall be at least 3,600 m/hr (200 fpm).

5.4 Verify that the direction of air flow through all NDO's is inward. Use streamers, smoke tubes, tracer gases, etc. Strips of plastic wrapping film have been found to be effective. Monitor the direction of air flow at intervals of at least 10 minutes for at least 1 hour.

6. QUALITY ASSURANCE

6.1 The success of this protocol lies in designing the TTE to simulate the conditions that exist without the TTE, i.e., the effect of the TTE on the normal flow patterns around the affected facility or the amount of fugitive VOC emissions should be minimal. The TTE must enclose the application stations, coating reservoirs, and all areas from the application station to the oven. The oven does not have to be enclosed if it is under negative pressure. The NDO's of the temporary enclosure and a fugitive exhaust fan must be properly sized and placed.

6.2. Estimate the ventilation rate of the TTE that best simulates the conditions that exist without the TTE, i.e., the effect of the TTE on the normal flow patterns around the affected facility or the amount of fugitive VOC emissions should be minimal. Figure 1 may be used as an aid. Measure the concentration (C_G) and flow rate (Q_G) of the captured gas stream, specify a safe concentration (C_F) for the fugitive gas stream, estimate the CE, and then use the plot in Figure 1 to determine the volumetric flowrate of the fugitive gas stream (Q_F). A fugitive VOC emission exhaust fan that has a variable flow control is desirable.

6.2.1 Monitor the concentration of VOC into the capture device without the TTE. To minimize the effect of temporal variation on the captured emissions, the baseline measurement should be made over as long a time period as practical. However, the process conditions must be the same for the measurement in Section 6.2.3 as they are for this baseline measurement. This may require short measuring times for this quality control check before and after the construction of the TTE.

6.2.2 After the TTE is constructed, monitor the VOC concentration inside the TTE. This concentration shall not continue to increase and must not exceed the safe level according to OSHA requirements for permissible exposure limits. An increase in VOC concentration indicates poor TTE design or poor capture efficiency.

6.2.3 Monitor the concentration of VOC into the capture device with the TTE. To limit the effect of the TTE on the process, the VOC concentration with and without the TTE must be within ±10 percent. If the measurements do not agree, adjust the ventilation rate from the TTE until they agree within 10 percent.

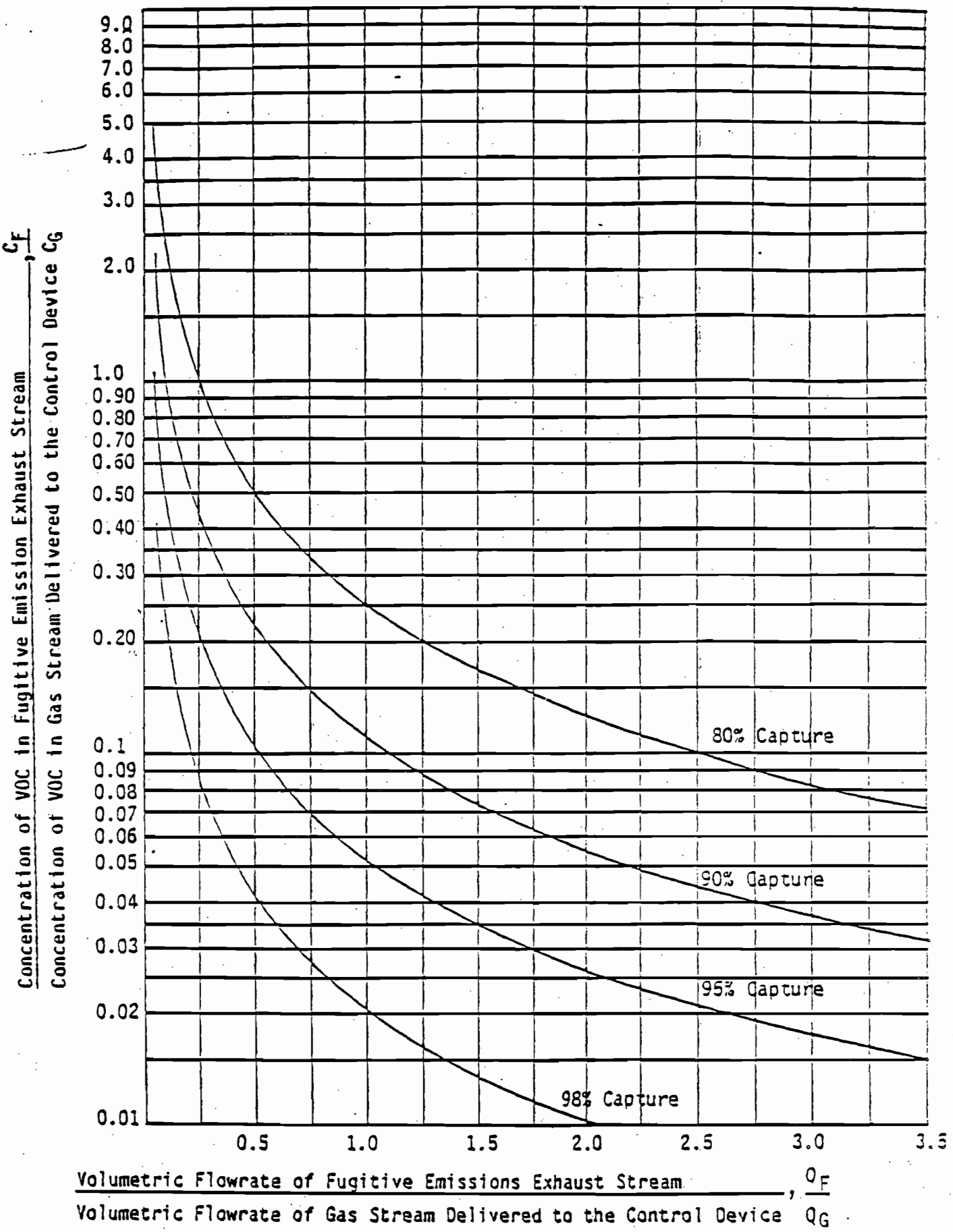


Figure 1. The Crumpler Chart