DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

	Initial	Date
1. TO: (NAME, OFFICE, LOCATION) Bruce Mitchell		
2. Bureau of Air Quality Manag-		
3.		
4.		

RECEIVED
NOV 22 1988
DER-BAQM

REMARKS:

FYI

Please review and provide comments. Permit appl. to be reviewed here in the district as we discussed.

mid 11-28-88

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: John Turner

DATE 11/21/88

PHONE SC 325-1202

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTHWEST DISTRICT
7601 HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610-9544

BOB GRAHAM
GOVERNOR
VICTORIA J. TSCHINKEL
SECRETARY
RICHARD D. GARRITY, PH.D.
DISTRICT MANAGER

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

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

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

COMPANY NAME: Spiralkote 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) W&H Flexorex CC 746 Printing Press

SOURCE LOCATION: Street 1200 Central Florida Parkway City Orlando (32809)

UTM: East 461370 North 3142050

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

APPLICANT NAME AND TITLE: Robert E. Kindorf, Vice President of Production

APPLICANT ADDRESS: 1200 Central Florida Parkway, Orlando, FL 32809

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

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

I certify that the statements made in this application for a construction 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: Robert E. Kindorf

Robert E. Kindorf, Vice President
Name and Title (Please Type)

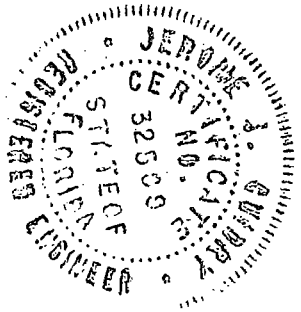
Date: 11-9-88 Telephone No. (407) 859-7780

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 ~~xxxxxxx~~/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, that

[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 J. Guidry

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

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

889 N. Orange Avenue, Orlando, FL 32801-1088
Mailing Address (Please Type)

Florida Registration No. 32589 Date: 11-17-88 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.

To construct a W&H Flexorex CC 746 printing press. Emissions will be controlled by two (2) catalytic incinerators and will result in full compliance with 17-2 FAC.

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

Start of Construction December, 1988 Completion of Construction November, 1989

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.)

Approximately $300,000

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

A048-125735 Cyrel Plate Room

A048-146002 Kidder CI press

A048-137831 Olympia 746 Flexographic Press

E. Requested permitted equipment operating time: hrs/day 24 ; dsys/wk 7 ; wks/yr 52 ; if power plant, hrs/yr 8760; if seasonal, describe: _____

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No

   a. If yes, has "offset" been applied? No

   b. If yes, has "Lowest Achievable Emission Rate" been applied? No

   c. If yes, list non-attainment pollutants. Ozone Maintenance Area

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? Yes*

   a. If yes, for what pollutants? VOC

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

*FAC 17-2.650(1)(f)16.b(i)(c)

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
Paper	None	N/A	26 reams/hr	1
Ink	VOC	44	37.0	2
Varnish KJ902	VOC	62	14.2	3
Varnish NB1061	VOC	42	20.0	3
Ethyl Alcohol	VOC	100	9.74	2 & 3

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A Printing Process

2. Product Weight (lbs/hr): N/A 26 reams/hr maximum printing speed

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
VOC	21.5	94.17	*	21.5	51.82	227.1	4

[1]See Section V, Item 2. *17-2.650 (1)(f)16.b(i)(c)90% destruction

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
Ethyl Acetate	VOC	100	1.0	2 & 3
n-Propyl Alcohol	VOC	100	3.6	2 & 3
n-Propyl Acetate	VOC	100	3.0	2 & 3
Glycol Ether	VOC	100	1.0	2 & 3

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
(2) Custom built	VOC	90%	N/A	Manufacturer
Etter Engineering			—	Specifications
Catalytic Incinerators;				Stack
one (1) 5000 CFM on				
CI Deck and one (1)				
4000 CFM on downstream Deck				

E. Fuels Natural Gas for all heating

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr 60%	max./hr	
Between color drier	0.0006	0.0010	1.1
Coater drier	0.0006	0.0010	1.1
Overhead drier	0.0015	0.0025	2.6
4000 CFM Incinerator	0.0009	0.0011	1.2
5000 CFM Incinerator	0.0011	0.0015	1.6

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: N/A Percent Ash: N/A

Density: _____ lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: 1052 BTU/ft^3 BTU/lb _____ BTU/gal

Other Fuel Contaminants (which may cause air pollution): _____

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum _____

G. Indicate liquid or solid wastes generated and method of disposal.

Some solvents are reclaimed by distillation. Waste solvents, coatings and inks are shipped to Oldover Corporation, Green Cove Springs, where they are burned in their boilers.

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 30 ft. Stack Diameter: 1.26 ft.

Gas Flow Rate: 5000 ACFM 2978 DSCFM Gas Exit Temperature: 400 °F.

Water Vapor Content: 3 % Velocity: 66.8 FPS

SECTION IV: INCINERATOR INFORMATION N/A

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

Total Weight Incinerated (lbs/hr) _____ Design Capacity (lbs/hr) _____

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr. _____

Manufacturer _____

Date Constructed _____ Model No. _____

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diamter: _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity: _____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) _____

Downstream Incinerator

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 30 ft. Stack Diameter: 1.26 ft.

Gas Flow Rate: 4000 ACFM 2382 DSCFM Gas Exit Temperature: 400 °F.

Water Vapor Content: 3 % Velocity: 53.5 FPS

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: ___ ft. Stack Diameter: ___ ft.

Gas Flow Rate: ___ ACFM ___ DSCFM Gas Exit Temperature: ___ °F.

Water Vapor Content: ___ % Velocity: ___ FPS

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: ___ ft. Stack Diameter: ___ ft.

Gas Flow Rate: ___ ACFM ___ DSCFM Gas Exit Temperature: ___ °F.

Water Vapor Content: ___ % Velocity: ___ FPS

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: ___ ft. Stack Diameter: ___ ft.

Gas Flow Rate: ___ ACFM ___ DSCFM Gas Exit Temperature: ___ °F.

Water Vapor Content: ___ % Velocity: ___ FPS

Brief description of operating characteristics of control devices: _____

_____

_____

_____

_____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

_____

_____

_____

_____

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY N/A

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [ ] No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION N/A

A. Company Monitored Data

1. _____ no. sites _____ TSP _____ ( ) SO^2* _____ Wind spd/dir

Period of Monitoring _____/_____/_____ to _____/_____/_____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)_____

3. Upper air (mixing height) data obtained from (location)_____

4. Stability wind rose (STAR) data obtained from (location)_____

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate
TSP	_____ grams/sec
SO^2	_____ grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

SOURCE DESCRIPTION

Spiralkote, Inc. is proposing to construct a W&H Flexorex CC 746 Printing press at its Central Florida facility. The construction of this press will result in a minor modification to a minor facility with a resulting significant emission increase.

Combined current emissions from this facility are 87.45 tons per year of volatile organic compounds (VOC) under permits A048-125735, A048-146002 and A048-137831. Expected emission for this source are 94 tons per year VOC. Since this new source will emit less than 100 tons per year VOC, it is not considered a major modification. Because this is not to be a major modification, lowest achievable emission rate (LAER) does not apply. Standards of Performance for New Stationary Sources (NSPS) and new source review does not apply per FAC 17-2.500(2)(d)2.b..

Reasonably achievable control technology (RACT) applies to this source. Spiralkote proposes to achieve a capture efficiency of 65% and the minimum destruction efficiency of 90% for control of VOC emissions for this source.

There are essentially two printing zones associated with this press: a central impressions (CI) zone with six (6) printing decks and a downstream zone with one (1) printing deck. Emissions from each of the two zones will be controlled independently by catalytic incinerators. The CI zone will be controlled by an Etter Engineering Model 5000 CFM catalytic incinerator while the downstream zone will be controlled with a model 4000 CFM catalytic incinerator.

SUPPLEMENTAL REQUIREMENTS

Supplement 1:

Process input rate of 26 reams of paper per hour is based on the manufacturer's maximum design printing rate. Raw material (inks, varnish and solvents) was derived from historic data (1987 annual operation report) from the Olympia 746 press. Projected maximum material usage rates are referenced in Section III A of the application.

Supplements 2&3:

Emissions are based on 65% capture and 90% destruction efficiency as shown below.

Emissions Before Control

Ink (various colors) percent VOC based on average of inks used. See Certificate of Completion for AC48-82733 submitted 2/29/88.

(37.0 lbs/hr)(0.44) = 16.28 lbs VOC/hr available
(16.28 lbs/hr)(8760 hrs/yr)(1 Ton/2000 lbs) = 71.30 Tons/Yr

Varnish KJ 902

(14.2 lbs/hr)(0.62) = 8.80 lbs VOC/hr available
(8.80 lbs/hr)(8760 hrs/yr)(1 Ton/2000 lbs) = 38.60 Tons/Yr

Varnish NB 1061

(20.0 lbs/hr)(0.42) = 8.40 lbs VOC/hr available
(8.40 lbs/hr)(8760 hrs/yr)(1 Ton/2000 lbs) = 36.80 Tons/Yr

Ethyl Alcohol

9.74 lbs VOC/hr available
(9.74 lbs/hr)(8760 hrs/yr)(1 Ton/2000 lbs) = 42.70 Tons/yr

Ethyl Acetate

1.00 lbs VOC/hr available
(1.00 lbs/hr)(8760 hrs/yr)(1 Ton/2000 lbs) = 4.38 Tons/Yr

n-propyl Alcohol

3.60 lbs VOC/Hr available
(3.60 lbs/hr)(8760 hrs/yr)(1 Ton/2000 lbs) = 15.80 Tons/Yr

n-propyl Acetate

3.00 lbs VOC/hr available
(3.00 lbs/yr)(8760 hrs/yr)(1 Ton/2000 lbs) = 13.14 Tons/Yr

Glycol Ether

1.00 lbs VOC/hr available
(1.00 lbs/yr)(8760 hrs/yr)(1 Ton/2000 lbs) = 4.38 Tons/Yr

Summary of emissions before control

Material	lbs/hr	Tons/yr
Ink	16.28	71.30
Varnish KJ 902	8.80	38.60
Varnish KJ 1061	8.40	36.80
Ethyl Alcohol	9.74	42.70
Ethyl Acetate	1.00	4.38
n-propyl Alcohol	3.60	15.80
n-propyl Acetate	3.00	13.14
Glycol Ether	1.00	4.38
Total	51.82	227.1

Controlled emissions based on 65% capture and 90% destruction

(51.82 lbs/hr)(0.65)(1-0.9) = 3.368 lbs/hr controlled
(51.82 lbs/hr)(1-0.65) = 18.137 lbs/hr fugitive
Total hourly emissions = 21.5 lbs VOC/hr

(21.5 lbs VOC/hr)(8760 hrs/yr)(1 Ton/2000 lbs) = 94.17 Tons/yr

Compliance will be demonstrated by an EPA method 25 test. Capture efficiency is difficult to determine on a flexographic printing press. Capture will be determined using a combination of material balance and FID measurements (if necessary) at various ducts around the system. Because of the uniqueness of each system, the details of the testing procedure for capture cannot be determined until the system is fully operational. The procedure will be similar to that used on the other presses at Spiralkote.

Supplement 4&5:

Attached manufacturers specifications

Supplement 6-9:

Attached

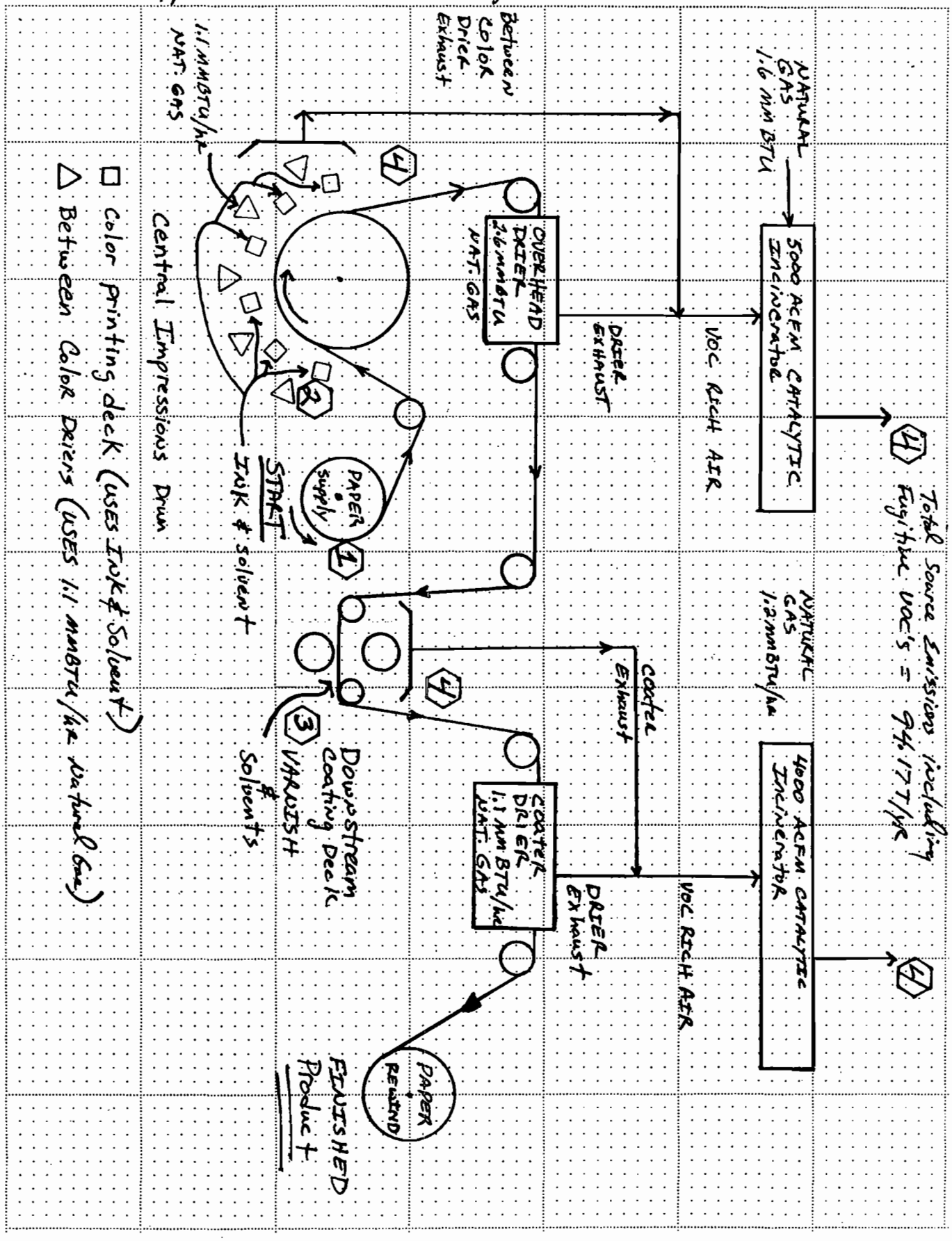
Supplement 10:

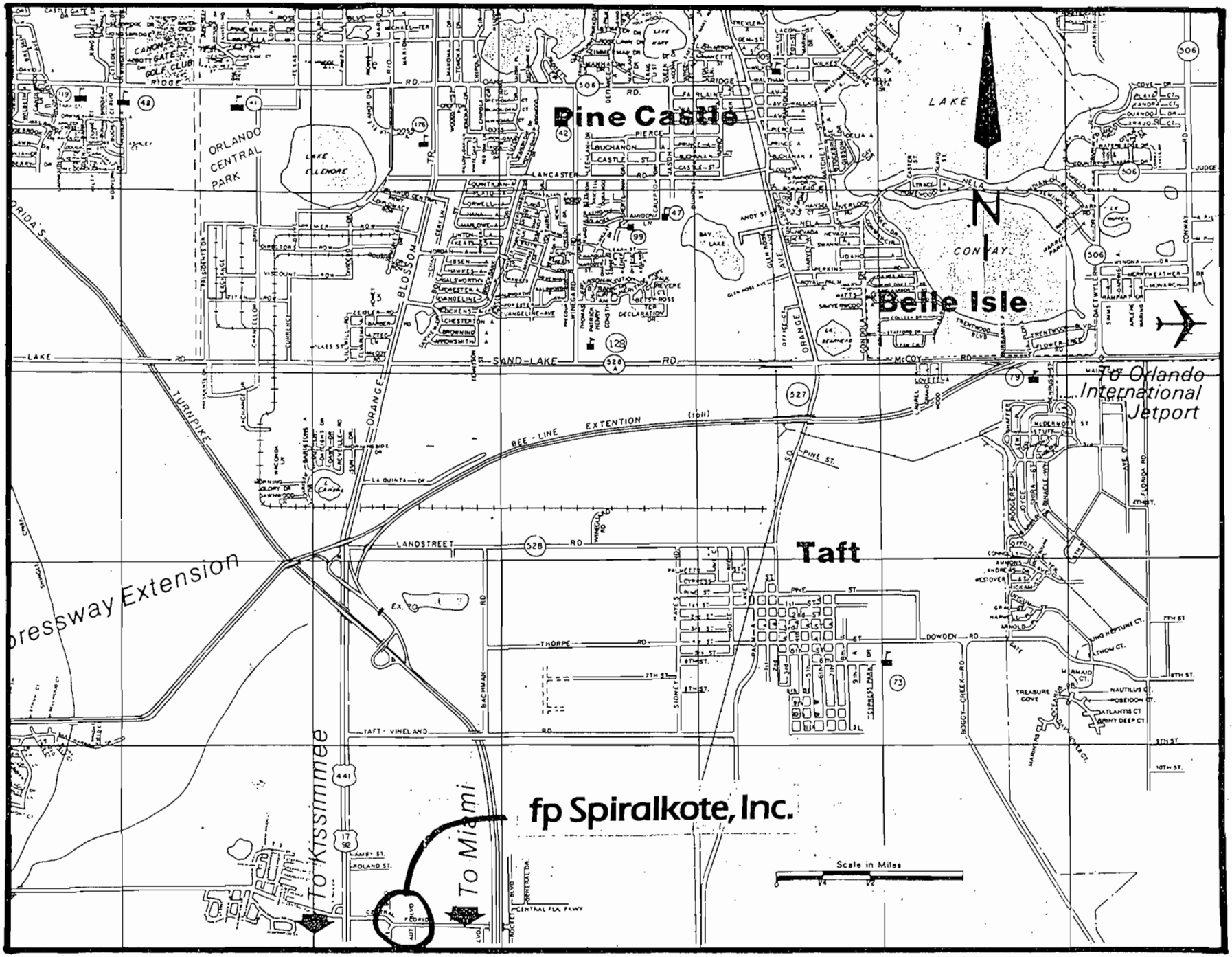
N/A

GROVE SCIENTIFIC

COMP. BY: Bruno Ferraro
CHK. BY: Jerome Guiday
DATE: 10-26-88
SHEET NO.:
JOB NO.: 03-025.00

SUBJECT: Spiral Kote, Inc. - Flexorex CC 746 Press. Supplement 6: Flow Diagram

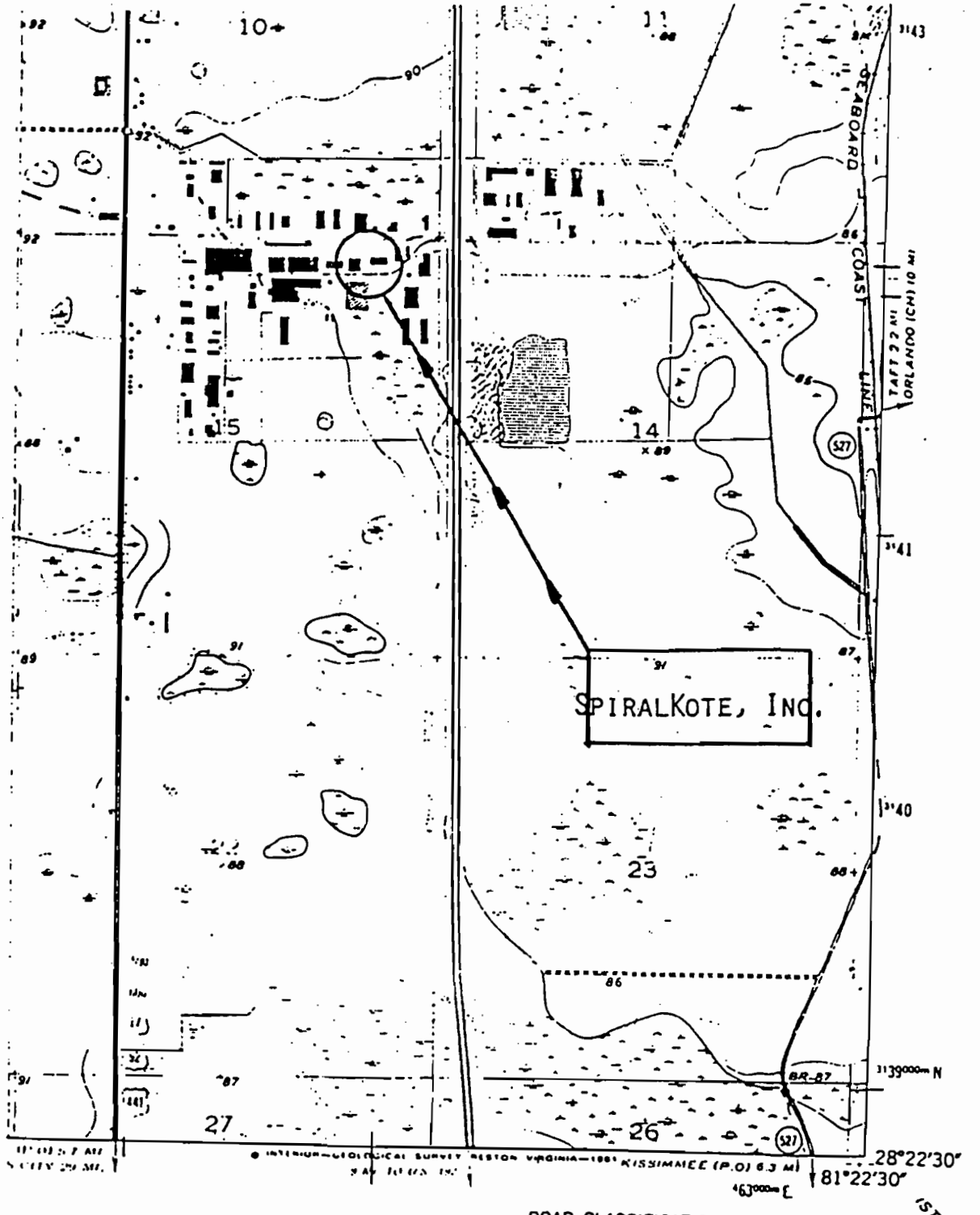




SPIRALKOTE, INC. - GENERAL LOCATION MAP

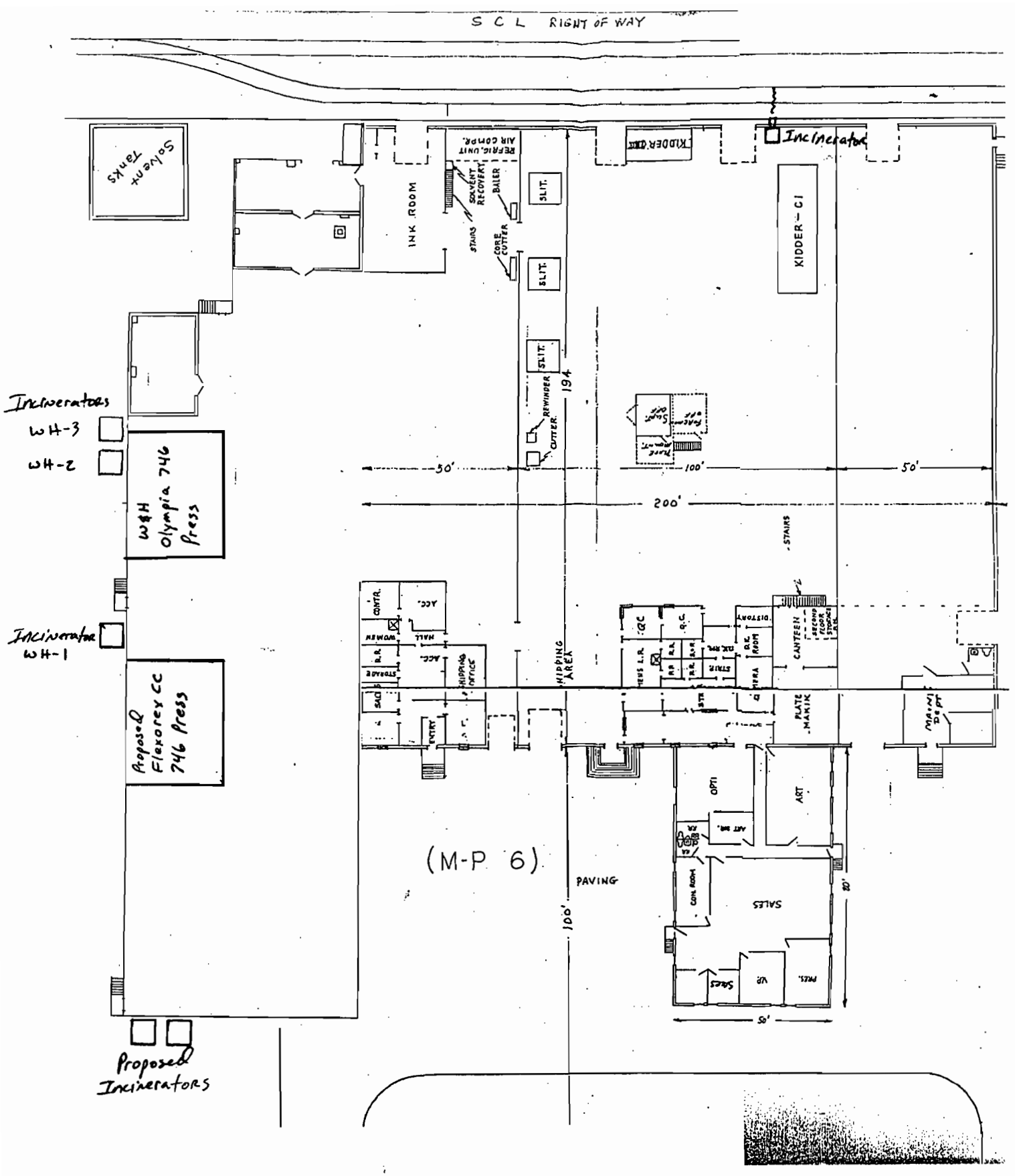
SITE LOCATION MAP -- U.S.G.S. MAP SECTION

SPIRALKOTE, INC.



ROAD CLASSIFICATION

1ST. CL


S C L RIGHT OF WAY
Solvent Tanks
INK ROOM
REFRIG. UNIT
AIR COMPR.
SOLVENT RECOVERY
BALER
STAIRS
CORE CUTTER
SLIT.
SLIT.
SLIT.
REWINDER
CUTTER
194
KIDDER DIE
KIDDER - CI
Incinerator
Incinerators
WH-3
WH-2
W&H Olympia 746 press
50'
100'
50'
200'
STAIRS
Incinerator WH-1
Proposed Flexorex CC 746 Press
CONTR.
ACC.
WOMEN
HALL
ACC.
R.R.
STORAGE
SHIPPING OFFICE
SHIPPING AREA
QC
R.C.
MEN'S L.R.
R.R.
R.R.
R.R.
STAIR
DISTONT
R.R. ROOM
CANTEEN
SECOND FLOOR STORAGE
PLATE MAKIK
MAINT. DEPT
STR
OPTI
ART
ART MR.
CON ROOM
SALES
Sales
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PRES.
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PAVING
(M-P 6)
Proposed Incinerators

File

EPA

ETTER ENGINEERING COMPANY, INC.

4 KIDDER ROAD • CHELMSFORD, MASSACHUSETTS 01824
TELEPHONE: (617) 256-0980

REC[illegible]

1985

January 8, 1985

Fleming Packaging Corp.
Spiralkote, Inc.
1200 Central Florida Pkwy.
Orlando, FL 32809

Attention: Robert Kindorf--Vice-President, Production

Reference: Catalytic Reactor Test

Dear Robert,

Enclosed is a copy of the test report done by Affiliated Environmental Services, Inc. of Sandusky, Ohio for Pillar Corporation at their C.B. Henschel Company installation in New Berlin, Wisconsin. They applied the Method 25 EPA stack test for Volotile Organic Compounds to the Pillar 15,000SCFM catalytic reactor. The reactor was connected to the 7 gravure laminating and coating machines employing the following solvents: ethyl acetate, I.P. acetate, isopropanol, and xyol alcohol. The sampling equipment and method was as follows:

a) VOC test consisted of simultaneous sampling at the "inlet" and "outlet" for 60 minutes
b) the VOC was sampled using two sets of EPA method 25 type
c) Byron model 90 sample collection units, consisting of probes, heavy hydrocarbon traps, pump mass flow rate/integrator and Tedlar bag
d) the heavy hydrocarbon trap sample is treated using Byron model 75 hydrocarbon converter
e) introduced into a Byron 401 analyzer gas chromatograph (flame ionization detector)

The results of the test are as follows:

a) at a preset inlet air temperature of 450°F, the efficiency is 98.8%
b) at a preset inlet air temperature of 525°F, the efficiency is 98.9%
c) at a preset inlet air temperature of 575°F, the efficiency is 99.3%

Catalytic Reactor Test

As you can see, the BTU/hr. required for pre-heats of 575°F versus 450°F doesn't derive any significant benefit in terms of efficiency i.e. 98.8% versus 99.3%. Therefore, a pre-heat of 450°F at 98.8% efficiency is more than adequate to meet EPA standards.

Further information on our design modifications and test results at Union Industries will be forthcoming as information is made available.

If I can be of further assistance, please let me know.

Sincerely,

Roger Decelles
Vice-President, Manufacturing

Enclosures

RED/ef

.... simplified!

How to Comply with Regulations Concerning Hydrocarbon Emissions

ETTER

ETTER ENGINEERING COMPANY, INC.

EQUIPMENT FUNCTION To destroy over 95% of VOC's (Volatile Organic Compounds) introduced into the unit before discharging into the atmosphere.

TYPE Catalytic bed incinerator design. Relatively low temperature air discharged from presses or coaters is preheated by a gas burner to a temperature where it will react with the catalytic bed.

CATALYST The metallic oxide catalyst causes the solvent in the exhaust stream to oxidize, and this exhaust exits the catalytic bed at a higher temperature than the entrance temperature.

HEAT EXCHANGER The heated exhaust stream passes over one side of a heat exchanger, and this recovered heat is transferred to the low temperature inlet exhaust stream.

SYSTEM CAPACITY

Model 4	2,500SCFM @ 1% LFL (8#/Hr. VOC)	4,000SCFM @ 8 to 18% LFL (86 to 194#/Hr. VOC)
Model 8	8,000SCFM @ 1% LFL (21#/Hr. VOC)	10,000SCFM @ 8 to 18% LFL (216 to 486#/Hr. VOC)

EQUIPMENT MODIFICATION Machines operating with 100% discharge are usually converted to partial recirculation. This reduces machine fuel costs, increases solvent LFL (Lower Flammability Limit), lowers exhaust volume and results in a smaller size Catalytic Ingestor.

Ingestor supply blower utilizes a single speed blower with motorized inlet damper. When multiple units or zones are to feed one ingestor, a variable speed drive or multiple blowers are required.

Design Features of the ETTER SOLVENT INGESTOR

DESTRUCTION EFFICIENCY – guaranteed 95% minimum VOC destruction. Figure can be much higher depending on solvent formulation.

HORIZONTAL FLAT BED DESIGN – catalyst is configured in a relatively shallow horizontal bed, eliminating the possibility of catalytic pellets crushing under their own weight. Bed settling has no effect on destruction efficiency.

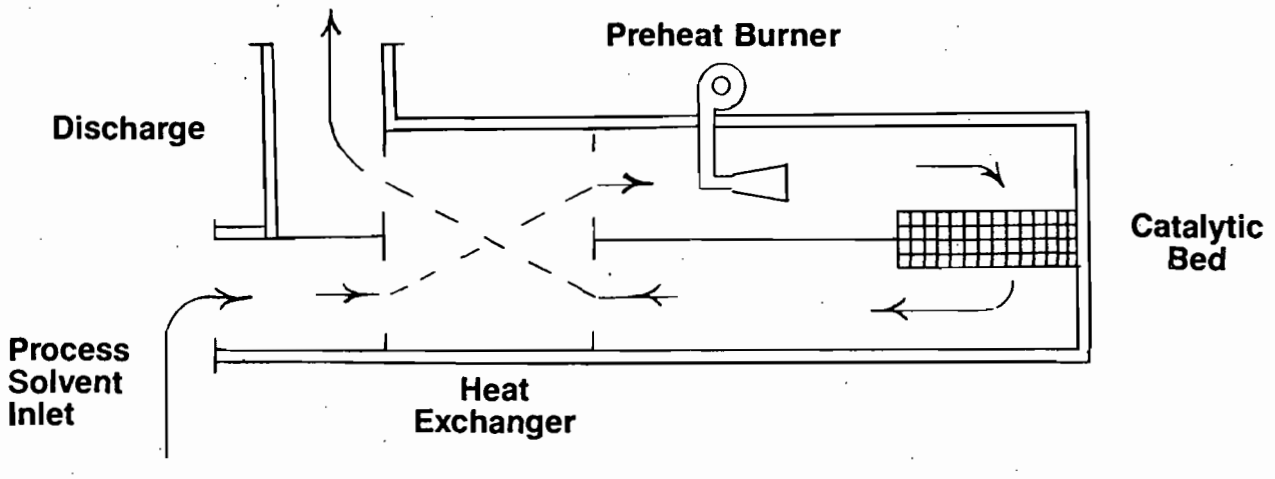
THERMAL CONSIDERATIONS – support trays and catalytic chamber fabricated stainless steel construction. Design eliminates any distress from thermal expansion, and will provide years of trouble free operation. Jacketed insulation reduces heat loss.

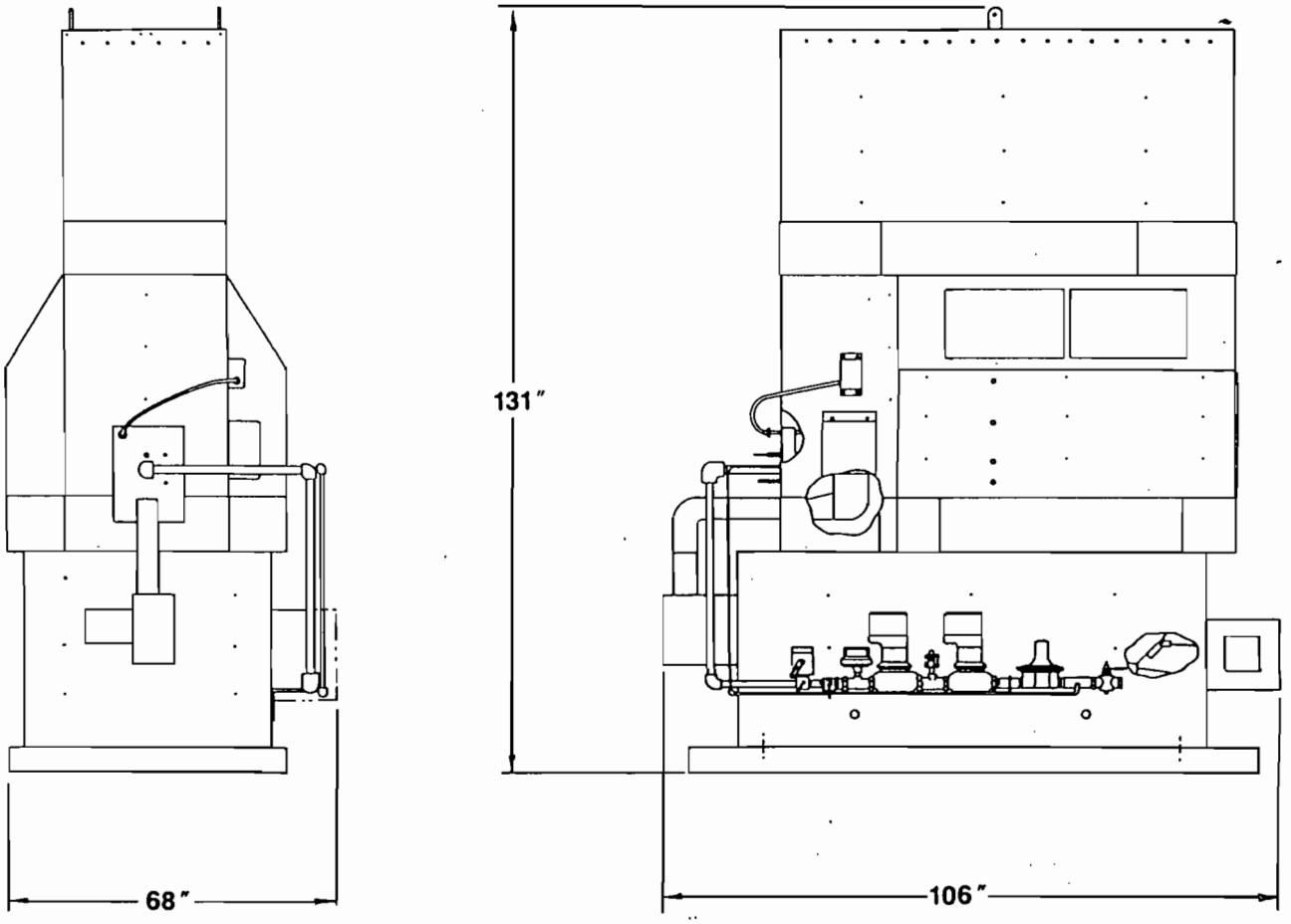
ECONOMY – minimum preheat fuel consumption due to low preheat levels. Solvent destruction in the catalytic bed generates heat, which is transferred via the heat exchanger to the cooler inlet process exhaust. The Model 8 unit becomes self-sustaining above 9% LFL, and requires no additional fuel.

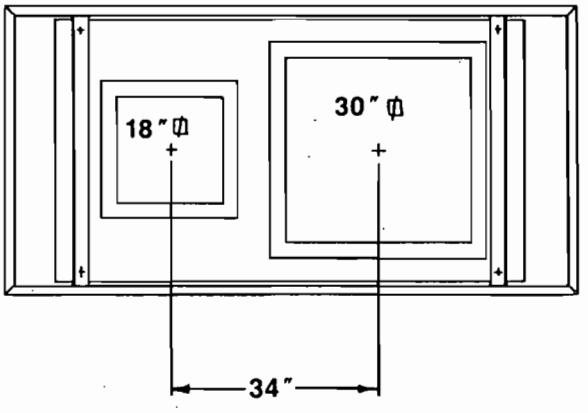
ACCESS – five access hatches in the Model 4 unit allow complete inspection of the catalytic bed area, or complete removal of the support trays. Model 8 incorporates hinged doors for full access.

CONTROLS – all controls are factory pre-set. No operator adjustments are required.

FLOW DIAGRAM OF SOLVENT INGESTOR







For Additional information, please contact:

ETTER ENGINEERING COMPANY, INC.

P.O. Box 5126
Hamden, CT 06518
(203) 288-3575

4 Kidder Road
Chelmsford, MA 01824
(617) 256-0980

CARULITE 100

INFORMATION SHEET

WHY CARULITE® 100?

The clean air needs of the eighties, originating both from an increased public awareness of the need for air purity and from newer technologies, have generated new uses for catalytic air purification methods. Since catalysts function by lowering the activation energy requirement for any given chemical transformation, catalytic processes usually are preferable to non-catalytic alternatives.

Increased public awareness of the need for air quality control has resulted in United States Environmental Protection Agency air quality standards for most common air pollutants, mainly hydrocarbons and carbon monoxide. Thermal incineration at temperatures higher than 1300°F will usually result in carbon monoxide emissions. Catalytic systems designed to control hydrocarbon emissions with Carulite® 100 will oxidize essentially all pollutants to carbon dioxide and water while operating at relatively low temperatures. Thermal incineration and noble metal catalytic oxidation may significantly increase nitrogen oxide formation due to high temperatures, but Carulite® 100 catalytic incineration results in much lower nitrogen oxide formation due to use of lower temperatures.

Carulite® 100 is used in the catalytic incineration of hydrocarbon gases generated in many printing, laminating and coating operations. Most solvents used in coating operations are catalytically oxidized at temperatures far lower than those required for noble metal catalysts and thermal incineration. Carulite® 100 effects the conversion of methyl ethyl ketone to carbon dioxide and water with an efficiency of 90% at temperatures as low as 350°F. Each individual component of a coating formulation has a unique temperature profile with Carulite® 100.

In combustion applications, catalytic oxidation is always exothermic and some of the heat involved raises the temperature of the catalyst itself. For applications related to high solvent levels in air streams, this temperature rise can reach several hundred degrees Fahrenheit. Carulite® 100 is especially rugged, withstanding operating temperatures up to 1000°F. While this heat of combustion represents valuable energy savings when captured by heat exchange techniques, care must be taken not to exceed the suggested maximum operating temperature. Although at higher temperatures some deterioration in catalyst performance will occur with time, this temperature effect is common to all known catalysts.

Catalytic vs. Thermal Incineration Applications

The conventional method of oxidizing waste gases has been the use of thermal incineration. Oxygen at very high temperatures combines with hydrocarbons to form carbon dioxide and water, and also with carbon monoxide to form carbon dioxide. The use of high temperatures for relatively long periods of time is the basis of thermal incineration as a method of oxidation. *Catalytic incineration* similarly combines oxygen with hydrocarbons and carbon monoxide to form harmless end products, but the oxidizing reaction occurs at *much lower temperatures* and consequently with *lower energy costs*.

Carulite® vs. Noble Metal Applications

Noble metal catalysts have also been used in catalytic incineration. Carulite® not only can be used in these same applications, but also has these benefits – it is much less costly than the noble metal catalysts, and it works at lower temperatures. See Figure 1.

Carulite® Catalytic Incineration

Some of the increased benefits of Carulite® use include *low capital investment* coupled with *relatively low operating expenses*. In addition, *low maintenance costs* and *long catalyst life* are advantages not found in thermal incineration. Finally, the use of Carulite® makes small, lightweight application systems feasible.

A large metal coating plant has successfully used Carulite® 100 for several years in control of volatile organic chemicals in metal printing. Annual cost savings directly attributable to use of Carulite® 100, with heat recovery, are approximately $250,000.

Figure 1.

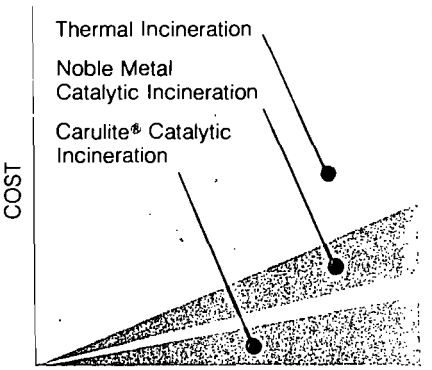


Table 1.

TYPICAL APPLICATIONS

Chemical Processes
Metal Decorating and Painting
Paper Printing and Coating
Coil Coating
Wire Drawing and Enameling
Textile Processing
Flexography
Offset Processes

Table 2.

EXAMPLES OF MATERIALS AND ODORS CONTROLLABLE WITH CARULITE® 100

Acetone	Ethyl Acetate
Acrolein	Ethylene
Amyl Alcohol	Formaldehyde
Benzaldehyde	Hi-Sol 4-2
Benzene	Hydrogen
2-Butanol	Magie Oils
Butyl Carbitol	Methyl Ethyl Ketone
Butyl Cellosolve	Mineral Spirits
Carbon Monoxide	Ozone
Cellosolve	140 Solvent
Cellosolve Acetate	Toluene
Diisobutyl Ketone	Xylene

Table 3.

PROPERTIES OF CARULITE® 100

Form	Extrusions
Color	Brown-Black
Bulk Density	55 to 60 lb/ft^3

Note: Carulite® catalysts are not recommended for air streams having appreciable quantities of halogens or compounds containing halogens. Similarly, sulfur-containing compounds should be avoided. These materials adversely affect catalyst life. In general, incidental or trace exposures to halogens or sulfur-containing materials should have little effect.

Carus Technical Services and Support

Technical Assistance

As an integral part of our sales philosophy, Carus provides extensive technical assistance to potential and current customers. We have a proven background in pollution control and catalytic oxidation technology and will provide continuing service related to catalyst performance as long as Carulite® 100 is in use.

Carus will provide you with all available information concerning your specific need including recommendations concerning catalyst bed configuration and optimum operating conditions. Carus does not provide equipment for use with Carulite® 100, but can recommend an equipment supplier, which is fully equipped to design and install equipment specifically for Carulite® 100 use in all VOC applications.

Evaluations

When necessary, Carus will conduct laboratory evaluations which duplicate, as closely as possible, the intended use. These evaluations can be useful in determination of special equipment design parameters. For example, smaller catalyst sizes often provide greater activity but, at the same time, create a greater pressure drop. Also, the amount of catalyst needed for a given application often can be minimized by alteration of well known operating variables involving both air flow and bed geometry.

Many catalyst applications require understanding of a blend of factors involving both the suitability of the catalyst for the gas stream in question and also the sometimes elaborate equipment needed to provide optimum catalyst performance.

Packaging

Carulite® 100 is packed in metal drums of 10 gallon capacity. Weight per drum = 50 lb net; 59 lb gross. Other container sizes available upon request.

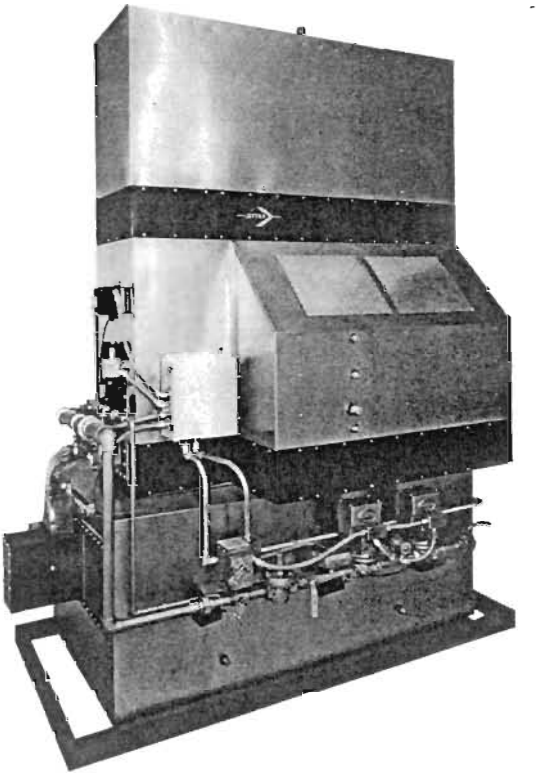
For further information call or write:

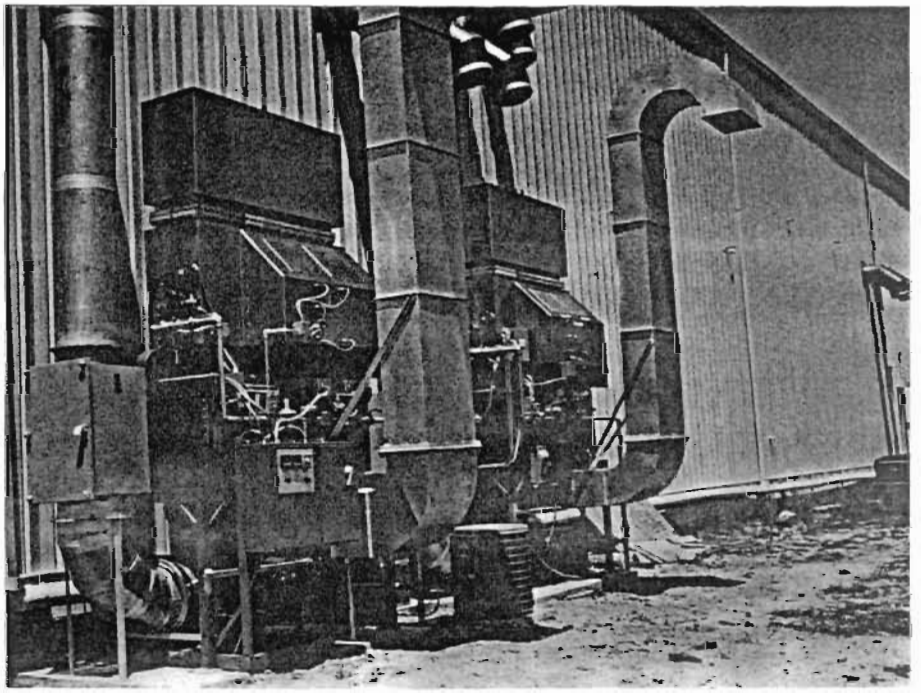
carus CHEMICAL COMPANY

Division of Carus Corporation
Special Products Department
1500 Eighth Street • LaSalle, Illinois 61301
Telephone: (815) 223-1500
(800) 435-6856 (Out of Illinois)
(800) 892-6831 (In Illinois)
Telex: 404452 • Cable: Carchemco

ETTER CATALYTIC INGESTOR ETTER

Unit shown prior to mounting on base stand. Base incorporates blower and control panels.





Installation photo of 2 of 3 units servicing a large Flexo press with an in-line 2 zone Gravure section.

FEATURES OF THE ETTER CATALYTIC INGESTOR

ECONOMICAL

1. $30 per CFM installation cost (capital equipment & normal installation).
2. Less than $3 per hour operating cost under typical loading. (9% LFL, 3000 CFM, $7/1000 ft^3 for gas) Can be less if capture is optimized.
3. Low operating temperatures — unique design allows operation with inlet air temperature to catalytic bed as low as 425 deg F.
4. Minimum floor space requirements. Can be installed in a space as small as 12′ x 9′.
5. Total destruction cost of under $400 per ton based on 70 tons per year and five year amortization of equipment. This is well below the $2000-$3000 per ton disposal cost considered feasible by the regulatory agencies. With 200 tons per year the disposal cost is less than $200 per ton.

FUNCTIONAL

1. Normal destruction efficiency of 95% guaranteed. 98% destruction under normal loading is typical.
2. Capacity can be over 300 tons per year (3 shifts, 75% up time, 75% capacity).

RELIABLE

1. High temperature stainless used in all critical areas. Brushed stainless skin for maintenance free performance over life of machine.
2. Internal components stack together for low thermal stress construction.
3. Low stress design minimizes catalyst loss. Less than 5% attrition is expected yearly under normal loading.

For Additional information, please contact:

ETTER

ETTER ENGINEERING COMPANY, INC.

P.O. Box 5126
Hamden, CT 06518
(203) 288-3575

4 Kidder Road
Chelmsford, MA 01824
(617) 256-0980

TEMPERATURE, CATAYLST, AND SOLVENT INGESTORS

An understanding of catalytic bed temperature and the introduction of solvents into the Ingestor is essential to maintenance of the bed.

1) At low or ambiant temperatures, catalyst will react with-at least to the extent of becoming surface coated- solvents in the air. This coating or "sponge" effect continues until the bed is heated to approximately 400°F, at which time a sharp rise or spike is noticable in the bed temperature. This is detrimental to the catalyst.

   This coating situation can occur in serveral ways:

   a) Long exposure to ambient plant air containing low level solvents, during protracted shutdown periods of the Ingestor.

   This can be minimized by setting any automatic dampers to the fresh air inlet preheat position to the Ingestor during long shutdowns.

   b) Operating the press with dampers in the water base/direct discharge mode unless the dampers are of the tight closing type. Even low level damper leaks can bypass a significant amount of solvents into the bed over a period of time.

   This problem can only be resolved by suitable dampers, or by keeping the bed at temperature while operating in this mode.

2) A new initial charge of catalyst should be operated at minimum temperature (approximately 150°F) for at least 4 hours, and then increased in steps of 100°F until equilibrium is reached in each step.

   If any possibility of a soaking or coating situation exists, the same procedure should be followed. It will not resolve the coating contamination, but <u>may</u> lower the detrimental high temperature spiking when operating temperature is reached.

3) All these problems are eliminated when the catalytic bed is operated at a minimum of 425°F (higher for some solvents). Destruction of solvents occurs continuously as they pass through the bed, and no buildup can occur. Field experience indicates many thousands of trouble free hours of catalytic operation are available from properly operated systems.

   All packaged Etter Solvent Ingestors include automatic 3 way preheat damper valve and/or press interlock, preventing solvent introduction into the Ingestor until the bed outlet is at operating temperature. If the Ingestor is operated every time the press or coater is operated, and none of the conditions listed in 1a) or 1b) above exist, the equipment can be started up simply by turning the Ingestor burner on.

ETTER ENGINEERING COMPANY, INC.

ATTENTION: USERS OF MNO_2 LOW TEMPERATURE CATALYST

REFERENCE: CATALYST POISONING

While MNO_2 provides a means to abate effluent VOC's at relatively low and, therefore, economical temperatures, it is, like any catalyst susceptable to "poisoning" by non-hydrocarbon, volatile, compounds. As specified in the quotation for the Etter Ingestor, these compounds include, silicones, halogens (chlorinated, florinated, etc. compounds), sulfur, and heavy metal compounds. The products of combustion of these compounds react with the surface of the catalyst or form an ash or salts which adhere to the surface of the catalyst thereby lowers the activity of the catalyst. While this lower activity causes no safety or health hazard, it does result in a loss of destruction efficiency which could result in non-compliant emmissions.

Historically, some catalyst poisoning has also been caused by overheating and other equipment malfunctions; and some poisoning has been unforeseen due to the undisclosed presence of known poisons in additives, surface treaters, or ink modifiers. Equipment malfunction poisoning is avoidable with proper safeguards. Avoiding poisons from coated or printed materials may be difficult due to nondisclosure policies of chemical suppliers or uncontrolled formulas which may or may not contain poisons. In any case, catalyst poisoning should be avoided or controlled to avoid costly catalyst replacement. Users of MNO_2, precious metal, or any catalyst, should take precautions to guarantee that no poisons are sent to the ingestor.

Suppliers of coatings should supply data sheets for coatings, adhesives, or inks to the user which identify all constituents. If data is not available, materials in questions should be tested prior to their application to the ingestor. Catalyst suppliers generally will test materials at no charge or for a nominal fee. If materials contain catalyst poisons, they should be avoided. In most cases, the poisons are in no way an integral part of the coating process, and suppliers should be willing to develop materials suitable for catalytic destruction. As an example, Dow and others have developed silicone adhesives and coatngs which do not emit volatile silicones and are, therefore, suitable for catalytic afterburning.

If the materials are of unknown or questionable mixtures, or a new material is to be applied, a qualified engineer or technician should contact Etter Engineering to establish a monitoring program to detect catalyst deterioration. Poisoned catalyst in the early stages can be replenished to reclaim a major portion of its activity. If poisoning is detected, a replenishing schedule should be developed or the poison should be eliminated. In all known cases, co-operative vendors have been able to supply poison free coatings. The replenishing method will reduce catalyst life and require catalyst replacement on a yearly or more frequent basis. We strongly recommend working with vendors to find suitable materials for catalytic abatement of VOC's.

continued.....

If any of the less frequently used chemicals are present in the inks or coatings, such as benzine, DMF, heptane, hexane, octane or xylene, a detailed review should be made before considering any catalytic material.

Please feel free to call Etter Engineering at any time with questions regarding suitability of solvents.

FORM #MMOP 6-10/87

INKS

MATERIAL SAFETY DATA SHEET

FOR PRINTING INK AND RELATED MATERIALS

INFORMATION ON THIS FORM IS PROPRIETARY INFORMATION AND FURNISHED SOLELY FOR THE USE OF OUR CUSTOMERS

DATE OF PREP 9-2-87 PREPARED BY H. E. Schepers

HAZARD RATINGS

Minimal	0
Slight	1
Moderate	2
Serious	3
Severe	4

HEALTH	2
FLAMMABILITY	3
REACTIVITY	0

Section I

MANUFACTURER'S NAME INMONT CORPORATION

STREET ADDRESS 36 TRIANGLE PARK

TRADE NAME 42000 PROMONT Y/S RHODAMINE RED

CITY STATE AND ZIP CODE CINCINNATI, OHIO 45246

PRODUCT CLASS SOLVENT INK OR LACQUER

EMERGENCY TELEPHONE NUMBERS
(513) 771-5888 H.E. Schepers
(201) 365-3512 Environmental Health Dept.
(800) 424-9300 CHEMTREC

MANUFACTURER'S CODE IDENTIFICATION

87CR5004

Section II - HAZARDOUS INGREDIENTS

Ingredient	CAS NO	Hazard Data	TLV/PPM
Ethanol	64-17-5		1000
Methanol	67-56-1		200
Isopropanol	67-63-0		400
n-Propanol	71-23-8		200
Ethyl Acetate	141-78-6		400
n-Propyl Acetate	109-60-4		200
n-Heptane	142-82-5		400
V.M.&P. Naptha	8030-30-6		300

Section III - PHYSICAL DATA

BOILING RANGE °F 147 - 244	VAPOR DENSITY: HEAVIER ☒ vs. air LIGHTER ☐	LIQUID DENSITY: HEAVIER ☐ vs. water LIGHTER ☒
APPEARANCE COLORED LIQUID	EVAPORATION RATE FASTER ☒ vs. Butyl Acetate SLOWER ☐	TYPE OF ODOR ORGANIC SOLVENTS

Section IV - FIRE & EXPLOSION DATA

FLAMMABILITY CLASSIFICATION	OSHA I B DOT FLAMMABLE	FLASH POINT RANGE °F (Method Used) 24 - 77 TCC	LOWEST LEL VOL % 1.0

EXTINGUISHING MEDIA:

☒ FOAM ☐ "ALCOHOL" FOAM ☒ CO_2 ☒ DRY CHEMICAL ☐ WATER FOG ☐ OTHER

UNUSUAL FIRE AND EXPLOSION HAZARDS VAPORS MAY IGNITE EXPLOSIVELY. VAPORS MAY SPREAD LONG DISTANCES. EXPOSURE OF CLOSED CONTAINERS TO EXCESS HEAT DURING FIRE MAY CAUSE DISRUPTIVE PRESSURE.

SPECIAL FIREFIGHTING PROCEDURES

USE WATER TO KEEP CLOSED CONTAINERS COOL

Section V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE

Eye contact will cause irritation. Skin contact will cause defatting which can lead to dermatitis. Inhalation of vapors can cause headache, nausea and irritation of nose and throat. Chronic exposure above the TLV can cause injury to the central nervous system and can cause other systemic effects.

PRIMARY ROUTE(S) OF ENTRY. ☒ DERMAL ☒ INHALATION

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT - Flush with water for 15 minutes - if irritation persists, get medical attention.
SKIN CONTACT - Wash well with soap and water - use suitable handcream.
INHALATION - Remove individual to fresh air. **INGESTION** - Call physician immediately.

Section VI - REACTIVITY DATA

PRODUCT STABILITY ☒ STABLE ☐ UNSTABLE

CONDITIONS TO AVOID Avoid contact with strong acids or oxidizers.

Section VII - SPILL OR LEAK PROCEDURES

PROCEDURE WHEN MATERIAL SPILLED OR RELEASED

Eliminate all sources of vapor ignition. Ventilate area.
Remove by using suitable inert absorbing material.

WASTE DISPOSAL METHOD In accordance with applicable local, State and Federal regulations.

Section VIII - SPECIAL PROTECTION INFORMATION

VENTILATION Use sufficient local and general ventilation to maintain vapor concentrations below stated TLV's and LEL.

PROTECTIVE GLOVES

EYE PROTECTION

Gloves and goggles or face shield should be worn during handling procedures where splashing is possible.

RESPIRATORY PROTECTION None required under normal operating conditions.

OTHER PROTECTIVE EQUIPMENT Protective clothing to prevent body contact.

Section IX - SPECIAL PRECAUTIONS

HANDLING AND STORING

Keep containers closed when not in use.
Keep away from excess heat.

OTHER PRECAUTIONS

MATERIAL SAFETY DATA SHEET
FOR PRINTING INK AND RELATED MATERIALS

INFORMATION ON THIS FORM IS PROPRIETARY INFORMATION AND FURNISHED SOLELY FOR THE USE OF OUR CUSTOMERS

DATE OF PREP. NOV. 20 1985 PREPARED BY H. E. Schepers

HAZARD RATINGS
Minimal 0
Slight 1
Moderate 2
Serious 3
Severe 4

HEALTH	2
FLAMMABILITY	3
REACTIVITY	0

Section I

MANUFACTURER'S NAME: INMONT CORPORATION
STREET ADDRESS: 36 TRIANGLE PARK
TRADE NAME: CATALYST
CITY, STATE AND ZIP CODE: CINCINNATI, OHIO 45246
PRODUCT CLASS: SOLVENT CATALYST FOR CROSS-LINKING CURE COATING
EMERGENCY TELEPHONE NUMBERS:
(513) 771-5888 H.E. Schepers
(201) 365-3512 Environmental Health Dept.
(800) 424-9300 CHEMTREC

MANUFACTURER'S CODE IDENTIFICATION: 51-53

Section II - HAZARDOUS INGREDIENTS

Ingredient	CAS NO.	Hazard Data: TLV/PPM	PEL/PPM
Toluene Sulfonic Acid	104-15-4	Not Applicable	
Isopropyl Alcohol	67-63-0	400	400

Section III - PHYSICAL DATA

BOILING RANGE °F	VAPOR DENSITY: HEAVIER ☒ vs. air LIGHTER ☐	LIQUID DENSITY: HEAVIER ☒ vs. water LIGHTER ☐
177		
APPEARANCE	**EVAPORATION RATE FASTER ☒ vs. Butyl Acetate SLOWER ☐**	**TYPE OF ODOR**
LIQUID		ALCOHOLIC

Section IV - FIRE & EXPLOSION DATA

FLAMMABILITY CLASSIFICATION		FLASH POINT RANGE °F (Method Used)	LOWEST LEL VOL %
OSHA I B DOT FLAMMABLE	67 PMCC	2.0	

EXTINGUISHING MEDIA:
☒ FOAM ☐ "ALCOHOL" FOAM ☒ CO_2 ☒ DRY CHEMICAL ☐ WATER FOG ☐ OTHER

UNUSUAL FIRE AND EXPLOSION HAZARDS: VAPORS MAY IGNITE EXPLOSIVELY. VAPORS MAY SPREAD LONG DISTANCES. EXPOSURE OF CLOSED CONTAINERS TO EXCESS HEAT DURING FIRE MAY CAUSE DISRUPTIVE PRESSURE.

SPECIAL FIREFIGHTING PROCEDURES: USE WATER TO KEEP CLOSED CONTAINERS COOL.

Section V - HEALTH HAZARD DATA

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Eye contact will cause irritation. Skin contact will cause defatting which can lead to dermatitis. Inhalation of vapors can cause headache, nausea and irritation of nose and throat. Chronic exposure above the TLV can cause injury to the central nervous system and can cause other systemic effects.

PRIMARY ROUTE(S) OF ENTRY: ☒ DERMAL ☒ INHALATION

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT - Flush with water for 15 minutes-if irritation persists, get medical attention.
SKIN CONTACT - Wash well with soap and water - use suitable handcream.
INHALATION - Remove individual to fresh air. INGESTION - Call physician immediately.

Section VI - REACTIVITY DATA

PRODUCT STABILITY ☒ STABLE ☐ UNSTABLE

CONDITIONS TO AVOID Keep away from acid sensitive materials.

Section VII - SPILL OR LEAK PROCEDURES

PROCEDURE WHEN MATERIAL SPILLED OR RELEASED

Eliminate all sources of vapor ignition. Ventilate area.
Remove by using suitable inert absorbing material.

WASTE DISPOSAL METHOD In accordance with applicable local, State and Federal regulations.

Section VIII - SPECIAL PROTECTION INFORMATION

VENTILATION Use sufficient local and general ventilation to maintain vapor concentrations below stated TLV's and LEL.

PROTECTIVE GLOVES

EYE PROTECTION

Gloves and goggles or face shield should be worn during handling procedures where splashing is possible.

RESPIRATORY PROTECTION None required under normal operating conditions.

OTHER PROTECTIVE EQUIPMENT Protective clothing to prevent body contact.

Section IX - SPECIAL PRECAUTIONS

HANDLING AND STORING Keep containers closed when not in use.
Keep away from excess heat.

OTHER PRECAUTIONS Material is corrosive.

MATERIAL SAFETY DATA SHEET
FOR PRINTING INK AND RELATED MATERIALS

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DATE OF PREP. NOV. 20 1985 PREPARED BY H. E. Schepers

HAZARD RATINGS
Minimal 0
Slight 1
Moderate 2
Serious 3
Severe 4

HEALTH	2
FLAMMABILITY	3
REACTIVITY	0

Section I

MANUFACTURER'S NAME: INMONT CORPORATION
STREET ADDRESS: 36 TRIANGLE PARK
TRADE NAME: Crystaphane Coating
CITY, STATE AND ZIP CODE: CINCINNATI, OHIO 45246
PRODUCT CLASS: Solvent Cross-Linking Coating
EMERGENCY TELEPHONE NUMBERS:
(513) 771-5888 H.E. Schepers
(201) 365-3512 Environmental Health Dept.
(800) 424-9300 CHEMTREC

MANUFACTURER'S CODE IDENTIFICATION:
NB1061

Section II - HAZARDOUS INGREDIENTS

Ingredient	CAS NO.	Hazard Data: TLV/PPM	PEL/PPM
n-butyl alcohol	71-36-3	50	100
n-propyl alcohol	71-23-8	200	200
xylene	1330-20-7	100	100
toluene	108-88-3	100	200
ethyl alcohol	64-17-5	1000	1000
isopropyl alcohol	67-63-0	400	400
V.M.&P. naphtha	64742-89-8	300	n.e.
free formaldehyde <.45% wt.	50-00-0	1	3

n.e. = not established

Section III - PHYSICAL DATA

BOILING RANGE °F: 173-281	VAPOR DENSITY: HEAVIER ☒ vs. air LIGHTER ☐	LIQUID DENSITY: HEAVIER ☐ vs. water LIGHTER ☒
APPEARANCE: Liquid	EVAPORATION RATE FASTER ☒ vs. Butyl Acetate SLOWER ☐	TYPE OF ODOR: aromatic

Section IV - FIRE & EXPLOSION DATA

FLAMMABILITY CLASSIFICATION	OSHA I B DOT flammable	FLASH POINT RANGE °F (Method Used): 58 PMCC	LOWEST LEL: 0.9

EXTINGUISHING MEDIA:
☒ FOAM ☐ "ALCOHOL" FOAM ☒ CO_2 ☒ DRY CHEMICAL ☐ WATER FOG ☐ OTHER

UNUSUAL FIRE AND EXPLOSION HAZARDS
Containers may rupture when exposed to excessive heat.

SPECIAL FIREFIGHTING PROCEDURES
Use water to keep closed containers cool.

Section V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE

Eye contact will cause irritation. Skin contact will cause defatting which can lead to dermatitis. Excessive breathing of vapors can cause headache, nausea and irritation of nose and throat. Overexposure may result in injury to the central nervous system.

Formaldehyde has been found to cause tumors in laboratory animals.

PRIMARY ROUTE(S) OF ENTRY: ☒ DERMAL ☒ INHALATION

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT - Flush with water for 15 minutes-if irritation persists, get medical attention.
SKIN CONTACT - Wash well with soap and water - use suitable handcream.
INHALATION - Remove individual to fresh air. INGESTION - Call physician immediately.

Section VI - REACTIVITY DATA

PRODUCT STABILITY ☒ STABLE ☐ UNSTABLE

CONDITIONS TO AVOID Avoid contact with strong acids or oxidizers.

Section VII - SPILL OR LEAK PROCEDURES

PROCEDURE WHEN MATERIAL SPILLED OR RELEASED

Eliminate all sources of vapor ignition. Ventilate area.
Remove by using suitable inert absorbing material.

WASTE DISPOSAL METHOD In accordance with applicable local, State and Federal regulations.

Section VIII - SPECIAL PROTECTION INFORMATION

VENTILATION Use sufficient local and general ventilation to maintain vapor concentrations below stated TLV's and LEL.

PROTECTIVE GLOVES

EYE PROTECTION Gloves and goggles or face shield should be worn during handling procedures where splashing is possible.

RESPIRATORY PROTECTION None required under normal operating conditions.

OTHER PROTECTIVE EQUIPMENT Protective clothing to prevent body contact.

Section IX - SPECIAL PRECAUTIONS

HANDLING AND STORING Keep containers closed when not in use.
Keep away from excess heat. Avoid freezing.

OTHER PRECAUTIONS

none

MATERIAL SAFETY DATA SHEET
FOR PRINTING INK AND RELATED MATERIALS

INFORMATION ON THIS FORM IS PROPRIETARY INFORMATION AND FURNISHED SOLELY FOR THE USE OF OUR CUSTOMERS

DATE OF PREP. _____ PREPARED BY H. E. Schepers

HAZARD RATINGS
Minimal 0
Slight 1
Moderate 2
Serious 3
Severe 4

HEALTH	3
FLAMMABILITY	3
REACTIVITY	0

Section I

MANUFACTURER'S NAME: INMONT CORPORATION

TRADE NAME: Crystaphane Coating

PRODUCT CLASS: Solvent Cross-Linking Coating

Catalytic

STREET ADDRESS: 36 TRIANGLE PARK

CITY, STATE AND ZIP CODE: CINCINNATI, OHIO 45246

EMERGENCY TELEPHONE NUMBERS:
(513) 771-5888 H.E. Schepers
(201) 365-3512 Environmental Health Dept.
(800) 424-9300 CHEMTREC

MANUFACTURER'S CODE IDENTIFICATION:
NB1061

Section II - HAZARDOUS INGREDIENTS

Ingredient	CAS NO.	Hazard Data: TLV/PPM	PEL/PPM
n-butyl alcohol	71-36-3	50	100
n-propyl alcohol	71-23-8	200	200
xylene	1330-20-7	100	100
toluene	108-88-3	100	200
ethyl alcohol	64-17-5	1000	1000
isopropyl alcohol	67-63-0	400	400
V.M.&P. naphtha	64742-89-8	100	100
free formaldehyde <.45% wt.	50-00-0	1	3

Section III - PHYSICAL DATA

BOILING RANGE °F	VAPOR DENSITY: HEAVIER ☒ vs. air LIGHTER ☐	LIQUID DENSITY: HEAVIER ☐ vs. water LIGHTER ☒
173-281		
APPEARANCE: Liquid	EVAPORATION RATE FASTER ☒ vs. Butyl Acetate SLOWER ☐	TYPE OF ODOR: aromatic

Section IV - FIRE & EXPLOSION DATA

FLAMMABILITY CLASSIFICATION		FLASH POINT RANGE °F (Method Used)	LOWEST LEL
OSHA: I B DOT: flammable		58 PMCC	0.9

EXTINGUISHING MEDIA:
☒ FOAM ☐ "ALCOHOL" FOAM ☒ CO_2 ☒ DRY CHEMICAL ☐ WATER FOG ☐ OTHER

UNUSUAL FIRE AND EXPLOSION HAZARDS
Containers may rupture when exposed to excessive heat.

SPECIAL FIREFIGHTING PROCEDURES
Use water to keep closed containers cool.

Section V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE

Eye contact will cause irritation. Skin contact will cause defatting which can lead to dermatitis. Excessive breathing of vapors can cause headache, nausea and irritation of nose and throat. Overexposure may result in injury to the central nervous system.

Formaldehyde has been found to cause tumors in laboratory animals.

PRIMARY ROUTE(S) OF ENTRY: ☒ DERMAL ☒ INHALATION

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT - Flush with water for 15 minutes-if irritation persists, get medical attention.
SKIN CONTACT - Wash well with soap and water - use suitable handcream.
INHALATION - Remove individual to fresh air. ***INGESTION*** *- Call physician immediately.*

Section VI - REACTIVITY DATA

PRODUCT STABILITY ☒ STABLE ☐ UNSTABLE

CONDITIONS TO AVOID Avoid contact with strong acids or oxidizers.

Section VII - SPILL OR LEAK PROCEDURES

PROCEDURE WHEN MATERIAL SPILLED OR RELEASED

Eliminate all sources of vapor ignition. Ventilate area.
Remove by using suitable inert absorbing material.

WASTE DISPOSAL METHOD In accordance with applicable local, State and Federal regulations.

Section VIII - SPECIAL PROTECTION INFORMATION

VENTILATION Use sufficient local and general ventilation to maintain vapor concentrations below stated TLV's and LEL.

PROTECTIVE GLOVES

EYE PROTECTION Gloves and goggles or face shield should be worn during handling procedures where splashing is possible.

RESPIRATORY PROTECTION None required under normal operating conditions.

OTHER PROTECTIVE EQUIPMENT Protective clothing to prevent body contact.

Section IX - SPECIAL PRECAUTIONS

HANDLING AND STORING Keep containers closed when not in use.
Keep away from excess heat. Avoid freezing.

OTHER PRECAUTIONS

none

MATERIAL SAFETY DATA SHEET

FOR PRINTING INK AND RELATED MATERIALS

DATE OF PREP 11/20/85 PREPARED BY H. E. Schepers

HAZARD RATINGS
Minimal 0
Slight 1
Moderate 2
Serious 3
Severe 4

HEALTH	3
FLAMMABILITY	3
REACTIVITY	0

Section I

MANUFACTURER'S NAME INMONT CORPORATION
STREET ADDRESS 36 TRIANGLE PARK
TRADE NAME 42000 PROMONT
CITY, STATE AND ZIP CODE CINCINNATI, OHIO 45246
PRODUCT CLASS SOLVENT INK OR LACQUER
EMERGENCY TELEPHONE NUMBERS:
(513) 771-5888 H.E. Schepers
(201) 365-3512 Environmental Health Dept.
(800) 424-9300 CHEMTREC

MANUFACTURER'S CODE IDENTIFICATION:

142490 V42256 W42981

Section II - HAZARDOUS INGREDIENTS

Ingredient	CAS NO.	Hazard Data: TLV/PPM
Ethanol	64-17-5	1000
Methanol	67-56-1	200
Isopropanol	67-63-0	400
n-Propanol	71-23-8	200
Ethyl Acetate	141-78-6	400
n-Propyl Acetate	109-60-4	200
n-Heptane	142-82-5	400
V.M.&P. Naptha	8030-30-6	300

Section III - PHYSICAL DATA

BOILING RANGE °F 147 - 244	VAPOR DENSITY: HEAVIER ☒ vs. air LIGHTER ☐	LIQUID DENSITY: HEAVIER ☐ vs. water LIGHTER ☒
APPEARANCE COLORED LIQUID	EVAPORATION RATE FASTER ☒ vs. Butyl Acetate SLOWER ☐	TYPE OF ODOR ORGANIC SOLVENTS

Section IV - FIRE & EXPLOSION DATA

FLAMMABILITY CLASSIFICATION	OSHA I B DOT FLAMMABLE	FLASH POINT RANGE °F (Method Used) 24 - 77 TCC	LOWEST LEL VOL % 1.0

EXTINGUISHING MEDIA:
☒ FOAM ☐ "ALCOHOL" FOAM ☒ CO_2 ☒ DRY CHEMICAL ☐ WATER FOG ☐ OTHER

UNUSUAL FIRE AND EXPLOSION HAZARDS VAPORS MAY IGNITE EXPLOSIVELY. VAPORS MAY SPREAD LONG DISTANCES. EXPOSURE OF CLOSED CONTAINERS TO EXCESS HEAT DURING FIRE MAY CAUSE DISRUPTIVE PRESSURE.

SPECIAL FIREFIGHTING PROCEDURES
USE WATER TO KEEP CLOSED CONTAINERS CCOL.

Section V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE

Eye contact will cause irritation. Skin contact will cause defatting which can lead to dermatitis. Inhalation of vapors can cause headache, nausea and irritation of nose and throat. Chronic exposure above the TLV can cause injury to the central nervous system and can cause other systemic effects.

PRIMARY ROUTE(S) OF ENTRY: ☒ DERMAL ☒ INHALATION

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT - Flush with water for 15 minutes-if irritation persists, get medical attention.
SKIN CONTACT - Wash well with soap and water - use suitable handcream.
INHALATION - Remove individual to fresh air. INGESTION - Call physician immediately.

Section VI - REACTIVITY DATA

PRODUCT STABILITY ☒ STABLE ☐ UNSTABLE

CONDITIONS TO AVOID Avoid contact with strong acids or oxidizers.

Section VII - SPILL OR LEAK PROCEDURES

PROCEDURE WHEN MATERIAL SPILLED OR RELEASED

Eliminate all sources of vapor ignition. Ventilate area.
Remove by using suitable inert absorbing material.

WASTE DISPOSAL METHOD In accordance with applicable local, State and Federal regulations.

Section VIII - SPECIAL PROTECTION INFORMATION

VENTILATION Use sufficient local and general ventilation to maintain vapor concentrations below stated TLV's and LEL

PROTECTIVE GLOVES

EYE PROTECTION Gloves and goggles or face shield should be worn during handling procedures where splashing is possible.

RESPIRATORY PROTECTION None required under normal operating conditions.

OTHER PROTECTIVE EQUIPMENT Protective clothing to prevent body contact.

Section IX - SPECIAL PRECAUTIONS

HANDLING AND STORING Keep containers closed when not in use.
Keep away from excess heat.

OTHER PRECAUTIONS

MATERIAL SAFETY DATA SHEET

FOR PRINTING INK AND RELATED MATERIALS

INFORMATION ON THIS FORM IS PROPRIETARY INFORMATION AND FURNISHED SOLELY FOR THE USE OF OUR CUSTOMERS

DATE OF PREP 7/1/85 PREPARED BY H. E. Schepers

HAZARD RATINGS
Minimal 0
Slight 1
Moderate 2
Serious 3
Severe 4

HEALTH	2
FLAMMABILITY	3
REACTIVITY	0

Section I

MANUFACTURER'S NAME: INMONT CORPORATION

STREET ADDRESS: 36 TRIANGLE PARK

TRADE NAME: FLEXOTUF & PROMONT INKS

CITY, STATE AND ZIP CODE: CINCINNATI, OHIO 45246

PRODUCT CLASS: SOLVENT INK

EMERGENCY TELEPHONE NUMBERS:
(513) 771-5888 H.E. Schepers
(201) 365-3512 Environmental Health Dept.
(800) 424-9300 CHEMTREC

MANUFACTURER'S CODE IDENTIFICATION: L 42279

Section II - HAZARDOUS INGREDIENTS

Ingredient:	CAS NO:	Hazard Data: TLV/PPM
Ethanol	64-17-5	1000
Isopropanol	67-63-0	400
n-Propanol	71-23-8	200
Ethyl Acetate	141-78-6	400
n-Propyl Acetate	109-60-4	200
n-Heptane	142-82-5	400
V.M.&P. Naphtha	8030-30-6	300
Methanol	67-56-1	200

Section III - PHYSICAL DATA

BOILING RANGE °F	VAPOR DENSITY: HEAVIER ☒ vs. air LIGHTER ☐	LIQUID DENSITY: HEAVIER ☒ vs. water LIGHTER ☐
147 - 244		
APPEARANCE	EVAPORATION RATE FASTER ☒ vs. Butyl Acetate SLOWER ☐	TYPE OF ODOR
COLORED LIQUID		ORGANIC SOLVENTS

Section IV - FIRE & EXPLOSION DATA

FLAMMABILITY CLASSIFICATION		FLASH POINT RANGE °F (Method Used)	LOWEST LEL VOL %
	OSHA I B DOT FLAMMABLE	24 - 77 TCC	1.0

EXTINGUISHING MEDIA:

☒ FOAM ☐ "ALCOHOL" FOAM ☒ CO_2 ☒ DRY CHEMICAL ☐ WATER FOG ☐ OTHER

UNUSUAL FIRE AND EXPLOSION HAZARDS VAPORS MAY IGNITE EXPLOSIVELY. VAPORS MAY SPREAD LONG DISTANCES. EXPOSURE OF CLOSED CONTAINERS TO EXCESS HEAT DURING FIRE MAY CAUSE DISRUPTIVE PRESSURE.

SPECIAL FIREFIGHTING PROCEDURES

USE WATER TO KEEP CLOSED CONTAINERS COOL

Section V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE

Eye contact will cause irritation. Skin contact will cause defatting which can lead to dermatitis. Inhalation of vapors can cause headache, nausea and irritation of nose and throat. Chronic exposure above the TLV can cause injury to the central nervous system and can cause other systemic effects.

PRIMARY ROUTE(S) OF ENTRY: ☒ DERMAL ☒ INHALATION

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT - Flush with water for 15 minutes-if irritation persists, get medical attention.
SKIN CONTACT - Wash well with soap and water - use suitable handcream.
INHALATION - Remove individual to fresh air. INGESTION - Call physician immediately.

Section VI - REACTIVITY DATA

PRODUCT STABILITY ☒ STABLE ☐ UNSTABLE

CONDITIONS TO AVOID Avoid contact with strong acids or oxidizers.

Section VII - SPILL OR LEAK PROCEDURES

PROCEDURE WHEN MATERIAL SPILLED OR RELEASED

Eliminate all sources of vapor ignition. Ventilate area.
Remove by using suitable inert absorbing material.

WASTE DISPOSAL METHOD In accordance with applicable local, State and Federal regulations.

Section VIII - SPECIAL PROTECTION INFORMATION

VENTILATION Use sufficient local and general ventilation to maintain vapor concentrations below stated TLV's and LEL

PROTECTIVE GLOVES

Gloves and goggles or face shield should be worn during handling procedures where splashing is possible.

EYE PROTECTION

RESPIRATORY PROTECTION None required under normal operating conditions.

OTHER PROTECTIVE EQUIPMENT Protective clothing to prevent body contact

Section IX - SPECIAL PRECAUTIONS

HANDLING AND STORING

Keep containers closed when not in use.
Keep away from excess heat

OTHER PRECAUTIONS

MATERIAL SAFETY DATA SHEET
FOR PRINTING INK AND RELATED MATERIALS

INFORMATION ON THIS FORM IS PROPRIETARY INFORMATION AND FURNISHED SOLELY FOR THE USE OF OUR CUSTOMERS

DATE OF PREP 9-2-87 PREPARED BY H. E. Schepers

HAZARD RATINGS

Minimal	0
Slight	1
Moderate	2
Serious	3
Severe	4

HEALTH	2
FLAMMABILITY	3
REACTIVITY	0

Section I

MANUFACTURER'S NAME INMONT CORPORATION

TRADE NAME 42000 PROMONT Y/S RHODAMINE RED B/S WATCHUNG RED G/S CYAN BLUE

PRODUCT CLASS SOLVENT INK OR LACQUER

STREET ADDRESS 36 TRIANGLE PARK

CITY STATE AND ZIP CODE CINCINNATI, OHIO 45246

EMERGENCY TELEPHONE NUMBERS
(513) 771-5888 H.E. Schepers
(201) 365-3512 Environmental Health Dept
(800) 424-9300 CHEMTREC

MANUFACTURER'S CODE IDENTIFICATION

R42379 87CR5004 T42433

Section II - HAZARDOUS INGREDIENTS

Ingredient	CAS NO	Hazard Data	TLV/PPM
Ethanol	64-17-5		1000
Methanol	67-56-1		200
Isopropanol	67-63-0		400
n-Propanol	71-23-8		200
Ethyl Acetate	141-78-6		400
n-Propyl Acetate	109-60-4		200
n-Heptane	142-82-5		400
V.M.&P. Naptha	8030-30-6		300

Section III - PHYSICAL DATA

BOILING RANGE °F	VAPOR DENSITY: HEAVIER ☒ vs. air LIGHTER ☐	LIQUID DENSITY: HEAVIER ☐ vs. water LIGHTER ☒
147 - 244		
APPEARANCE	**EVAPORATION RATE FASTER ☒ vs. Butyl Acetate SLOWER ☐**	**TYPE OF ODOR**
COLORED LIQUID		ORGANIC SOLVENTS

Section IV - FIRE & EXPLOSION DATA

FLAMMABILITY CLASSIFICATION		FLASH POINT RANGE °F (Method Used)	LOWEST LEL VOL %
OSHA I B DOT FLAMMABLE		24 - 77 TCC	1.0

EXTINGUISHING MEDIA:

☒ FOAM ☐ "ALCOHOL" FOAM ☒ CO_2 ☒ DRY CHEMICAL ☐ WATER FOG ☐ OTHER

UNUSUAL FIRE AND EXPLOSION HAZARDS VAPORS MAY IGNITE EXPLOSIVELY. VAPORS MAY SPREAD LONG DISTANCES. EXPOSURE OF CLOSED CONTAINERS TO EXCESS HEAT DURING FIRE MAY CAUSE DISRUPTIVE PRESSURE.

SPECIAL FIREFIGHTING PROCEDURES

USE WATER TO KEEP CLOSED CONTAINERS COOL

Section V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE

Eye contact will cause irritation. Skin contact will cause defatting which can lead to dermatitis. Inhalation of vapors can cause headache, nausea and irritation of nose and throat. Chronic exposure above the TLV can cause injury to the central nervous system and can cause other systemic effects.

PRIMARY ROUTE(S) OF ENTRY: ☒ DERMAL ☒ INHALATION

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT - Flush with water for 15 minutes- if irritation persists, get medical attention.
SKIN CONTACT - Wash well with soap and water - use suitable handcream.
INHALATION - Remove individual to fresh air. **INGESTION** - Call physician immediately.

Section VI - REACTIVITY DATA

PRODUCT STABILITY ☒ STABLE ☐ UNSTABLE

CONDITIONS TO AVOID Avoid contact with strong acids or oxidizers.

Section VII - SPILL OR LEAK PROCEDURES

PROCEDURE WHEN MATERIAL SPILLED OR RELEASED

Eliminate all sources of vapor ignition. Ventilate area.
Remove by using suitable inert absorbing material.

WASTE DISPOSAL METHOD In accordance with applicable local, State and Federal regulations.

Section VIII - SPECIAL PROTECTION INFORMATION

VENTILATION Use sufficient local and general ventilation to maintain vapor concentrations below stated TLV's and LEL.

PROTECTIVE GLOVES

EYE PROTECTION Gloves and goggles or face shield should be worn during handling procedures where splashing is possible.

RESPIRATORY PROTECTION None required under normal operating conditions.

OTHER PROTECTIVE EQUIPMENT Protective clothing to prevent body contact.

Section IX - SPECIAL PRECAUTIONS

HANDLING AND STORING Keep containers closed when not in use.
Keep away from excess heat.

OTHER PRECAUTIONS

MATERIAL SAFETY DATA SHEET

FOR PRINTING INK AND RELATED MATERIALS

INFORMATION ON THIS FORM IS PROPRIETARY INFORMATION AND FURNISHED SOLELY FOR THE USE OF OUR CUSTOMERS

DATE OF PREP NOV 21 1985 PREPARED BY H. E. Schepers

HAZARD RATINGS

Minimal 0
Slight 1
Moderate 2
Serious 3
Severe 4

HEALTH	3
FLAMMABILITY	3
REACTIVITY	0

Section I

MANUFACTURER'S NAME: INMONT CORPORATION

STREET ADDRESS: 36 TRIANGLE PARK

TRADE NAME: WAX COMPOUND

CITY, STATE AND ZIP CODE: CINCINNATI, OHIO 45246

PRODUCT CLASS: WATER & SOLVENT INKS

EMERGENCY TELEPHONE NUMBERS:
(513) 771-5888 H.E. Schepers
(201) 365-3512 Environmental Health Dept.
(800) 424-9300 CHEMTREC

MANUFACTURER'S CODE IDENTIFICATION:

K2011

Section II - HAZARDOUS INGREDIENTS

Ingredient:	CAS NO.	Hazard Data: TLV/PPM	FLASH POINT
Methanol	67-56-1	200	cc
Ethanol	64-17-5	1000	

Section III - PHYSICAL DATA

BOILING RANGE °F	VAPOR DENSITY: HEAVIER ☒	LIQUID DENSITY: HEAVIER ☐
147 - 173	vs. air LIGHTER ☐	vs. water LIGHTER ☒
APPEARANCE	EVAPORATION RATE FASTER ☒	TYPE OF ODOR
COLORLESS LIQUID	vs. Butyl Acetate SLOWER ☐	ALCOHOL

Section IV - FIRE & EXPLOSION DATA

FLAMMABILITY CLASSIFICATION		FLASH POINT RANGE °F (Method Used)	LOWEST LEL VOL %
OSHA I B	DOT FLAMMABLE	52 - 55 TCC	4.3

EXTINGUISHING MEDIA:

☒ FOAM ☐ "ALCOHOL" FOAM ☒ CO_2 ☒ DRY CHEMICAL ☐ WATER FOG ☐ OTHER

UNUSUAL FIRE AND EXPLOSION HAZARDS: VAPORS MAY IGNITE EXPLOSIVELY. VAPORS MAY SPREAD LONG DISTANCES. EXPOSURE OF CLOSED CONTAINERS TO EXCESS HEAT DURING FIRE MAY CAUSE DISRUPTIVE PRESSURE.

SPECIAL FIREFIGHTING PROCEDURES: USE WATER TO KEEP CLOSED CONTAINERS COOL.

Section V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE

Eye contact will cause irritation. Skin contact will cause defatting which can lead to dermatitis. Inhalation of vapors can cause headache, nausea and irritation of nose and throat. Chronic exposure above the TLV can cause injury to the central nervous system and can cause other systemic effects.

PRIMARY ROUTE(S) OF ENTRY: ☒ DERMAL ☒ INHALATION

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT - Flush with water for 15 minutes-if irritation persists, get medical attention.
SKIN CONTACT - Wash well with soap and water - use suitable handcream.
INHALATION - Remove individual to fresh air. INGESTION - Call physician immediately.

Section VI - REACTIVITY DATA

PRODUCT STABILITY ☒ STABLE ☐ UNSTABLE

CONDITIONS TO AVOID Avoid contact with strong acids or oxidizers.

Section VII - SPILL OR LEAK PROCEDURES

PROCEDURE WHEN MATERIAL SPILLED OR RELEASED

Eliminate all sources of vapor ignition. Ventilate area.
Remove by using suitable inert absorbing material.

WASTE DISPOSAL METHOD In accordance with applicable local, State and Federal regulations.

Section VIII - SPECIAL PROTECTION INFORMATION

VENTILATION Use sufficient local and general ventilation to maintain vapor concentrations below stated TLV's and LEL

PROTECTIVE GLOVES

EYE PROTECTION Gloves and goggles or face shield should be worn during handling procedures where splashing is possible.

RESPIRATORY PROTECTION None required under normal operating conditions.

OTHER PROTECTIVE EQUIPMENT Protective clothing to prevent body contact

Section IX - SPECIAL PRECAUTIONS

HANDLING AND STORING Keep containers closed when not in use.
Keep away from excess heat.

OTHER PRECAUTIONS

MATERIAL SAFETY DATA SHEET

FOR PRINTING INK AND RELATED MATERIALS

INFORMATION ON THIS FORM IS PROPRIETARY INFORMATION AND FURNISHED SOLELY FOR THE USE OF OUR CUSTOMERS

DATE OF PREP 6-13-88 PREPARED BY H. E. Schepers

HAZARD RATINGS

Minimal	0
Slight	1
Moderate	2
Serious	3
Severe	4

HEALTH	2
FLAMMABILITY	3
REACTIVITY	1

Section I

MANUFACTURER'S NAME: INMONT CORPORATION

STREET ADDRESS: 36 TRIANGLE PARK

TRADE NAME: MULTI BOND

CITY, STATE AND ZIP CODE: CINCINNATI, OHIO 45246

PRODUCT CLASS: SOLVENT INK

EMERGENCY TELEPHONE NUMBERS
(513) 771-5888 H.E. Schepers
(201) 365-3512 Environmental Health Dept.
(800) 424-9300 CHEMTREC

MANUFACTURER'S CODE IDENTIFICATION: WHITE - 88A1103
BLACK 88A1308
LT. BLUE 88A1279
DK BLUE 88A1280

Section II - HAZARDOUS INGREDIENTS

Ingredient	CAS NO.	Hazard Data: TLV/PPM
Ethanol	64-17-5	1000
Isopropanol	67-63-0	400
n-Propanol	71-23-8	200
Ethyl Acetate	141-78-6	400
n-Propyl Acetate	109-60-4	200
Tolusol	64742-89-81	200
Methanol	67-56-1	200

Section III - PHYSICAL DATA

BOILING RANGE °F	VAPOR DENSITY: HEAVIER ☒ vs. air LIGHTER ☐	LIQUID DENSITY: HEAVIER ☒ vs. water LIGHTER ☐
147 - 215		
APPEARANCE: COLORED LIQUID	EVAPORATION RATE FASTER ☒ vs. Butyl Acetate SLOWER ☐	TYPE OF ODOR: ORGANIC SOLVENTS

Section IV - FIRE & EXPLOSION DATA

FLAMMABILITY CLASSIFICATION		FLASH POINT RANGE °F (Method Used)	LOWEST LEL VOL %
OSHA I 3 DOT FLAMMABLE		20 - 77 TCC	1.0

EXTINGUISHING MEDIA:

☒ FOAM ☐ "ALCOHOL" FOAM ☒ CO_2 ☒ DRY CHEMICAL ☐ WATER FOG ☐ OTHER

UNUSUAL FIRE AND EXPLOSION HAZARDS VAPORS MAY IGNITE EXPLOSIVELY. VAPORS MAY SPREAD LONG DISTANCES. EXPOSURE OF CLOSED CONTAINERS TO EXCESS HEAT DURING FIRE MAY CAUSE DISRUPTIVE PRESSURE.

SPECIAL FIREFIGHTING PROCEDURES

USE WATER TO KEEP CLOSED CONTAINERS COOL

Section V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE

Eye contact will cause irritation. Skin contact will cause defatting which can lead to dermatitis. Inhalation of vapors can cause headache, nausea and irritation of nose and throat. Chronic exposure above the TLV can cause injury to the central nervous system and can cause other systemic effects.

PRIMARY ROUTE(S) OF ENTRY: ☒ DERMAL ☒ INHALATION

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT - Flush with water for 15 minutes-if irritation persists, get medical attention.
SKIN CONTACT - Wash well with soap and water - use suitable handcream.
INHALATION - Remove individual to fresh air. **INGESTION** - Call physician immediately.

Section VI - REACTIVITY DATA

PRODUCT STABILITY ☒ STABLE ☐ UNSTABLE

CONDITIONS TO AVOID Avoid contact with strong acids or oxidizers.

Section VII - SPILL OR LEAK PROCEDURES

PROCEDURE WHEN MATERIAL SPILLED OR RELEASED

Eliminate all sources of vapor ignition. Ventilate area.
Remove by using suitable inert absorbing material.

WASTE DISPOSAL METHOD In accordance with applicable local, State and Federal regulations.

Section VIII - SPECIAL PROTECTION INFORMATION

VENTILATION Use sufficient local and general ventilation to maintain vapor concentrations below stated TLV's and LEL.

PROTECTIVE GLOVES

EYE PROTECTION

Gloves and goggles or face shield should be worn during handling procedures where splashing is possible.

RESPIRATORY PROTECTION None required under normal operating conditions.

OTHER PROTECTIVE EQUIPMENT Protective clothing to prevent body contact.

Section IX - SPECIAL PRECAUTIONS

HANDLING AND STORING Keep containers closed when not in use.
Keep away from excess heat.

OTHER PRECAUTIONS

MATERIAL SAFETY DATA SHEET
FOR PRINTING INK AND RELATED MATERIALS

DATE OF PREP _____ PREPARED BY H. E. Schepers

HAZARD RATINGS

Minimal	0
Slight	1
Moderate	2
Serious	3
Severe	4

HEALTH	2
FLAMMABILITY	1
REACTIVITY	1

Section I

MANUFACTURER'S NAME INMONT CORPORATION

STREET ADDRESS 36 TRIANGLE PARK

TRADE NAME MULTI BOND

CITY, STATE AND ZIP CODE CINCINNATI, OHIO 45246

PRODUCT CLASS SOLVENT INK

EMERGENCY TELEPHONE NUMBERS
(513) 771-5888 H.E. Schepers
(201) 365-3512 Environmental Health Dept.
(800) 424-9300 CHEMTREC

Xmas Wrap Green

MANUFACTURER'S CODE IDENTIFICATION:

FGC 5703

Section II - HAZARDOUS INGREDIENTS

Ingredient	CAS NO.	Hazard Data: TLV/PPM
Ethanol	64-17-5	1000
Isopropanol	67-63-0	400
n-Propanol	71-23-8	200
Ethyl Acetate	141-78-6	400
n-Propyl Acetate	109-60-4	200
Tolusol	64742-89-81	200
Methanol	67-56-1	200

Section III - PHYSICAL DATA

BOILING RANGE °F	VAPOR DENSITY: HEAVIER ☒ vs. air LIGHTER ☐	LIQUID DENSITY: HEAVIER ☒ vs. water LIGHTER ☐
147 - 215		
APPEARANCE	**EVAPORATION RATE FASTER ☒ vs. Butyl Acetate SLOWER ☐**	**TYPE OF ODOR**
COLORED LIQUID		ORGANIC SOLVENTS

Section IV - FIRE & EXPLOSION DATA

FLAMMABILITY CLASSIFICATION	FLASH POINT RANGE °F (Method Used)	LOWEST LEL VOL %
OSHA I B DOT FLAMMABLE	20 - 77 TCC	1.0

EXTINGUISHING MEDIA:

☒ FOAM ☐ "ALCOHOL" FOAM ☒ CO_2 ☒ DRY CHEMICAL ☐ WATER FOG ☐ OTHER

UNUSUAL FIRE AND EXPLOSION HAZARDS VAPORS MAY IGNITE EXPLOSIVELY. VAPORS MAY SPREAD LONG DISTANCES. EXPOSURE OF CLOSED CONTAINERS TO EXCESS HEAT DURING FIRE MAY CAUSE DISRUPTIVE PRESSURE.

SPECIAL FIREFIGHTING PROCEDURES

USE WATER TO KEEP CLOSED CONTAINERS COOL

Section V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE

Eye contact will cause irritation. Skin contact will cause defatting which can leed to dermatitis. Inhalation of vapors can cause headache, nausea and irritation of nose and throat Chronic exposure above the TLV can cause injury to the central nervous system and can cause other systemic effects.

PRIMARY ROUTE(S) OF ENTRY: ☒ DERMAL ☒ INHALATION

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT - Flush with water for 15 minutes-if irritation persists, get medical attention.
SKIN CONTACT - Wash well with soap and water - use suitable handcream.
INHALATION - Remove individual to fresh air. **INGESTION** - Call physician immediately.

Section VI - REACTIVITY DATA

PRODUCT STABILITY ☒ STABLE ☐ UNSTABLE

CONDITIONS TO AVOID Avoid contact with strong acids or oxidizers.

Section VII - SPILL OR LEAK PROCEDURES

PROCEDURE WHEN MATERIAL SPILLED OR RELEASED

Eliminate all sources of vapor ignition. Ventilate area.
Remove by using suitable inert absorbing material.

WASTE DISPOSAL METHOD In accordance with applicable local, State and Federal regulations.

Section VIII - SPECIAL PROTECTION INFORMATION

VENTILATION Use sufficient local and general ventilation to maintain vapor concentrations below stated TLV's and LEL

PROTECTIVE GLOVES

EYE PROTECTION Gloves and goggles or face shield should be worn during handling procedures where splashing is possible.

RESPIRATORY PROTECTION None required under normal operating conditions.

OTHER PROTECTIVE EQUIPMENT Protective clothing to prevent body contact.

Section IX - SPECIAL PRECAUTIONS

HANDLING AND STORING Keep containers closed when not in use.
Keep away from excess heat.

OTHER PRECAUTIONS

FLEMING POTTER
Orlando

Customer Code Number	MSDS Number
S85-3108-B	2000-01

Ref No. - 289-920-01/572
02/18/86

MATERIAL SAFETY DATA SHEET

(For Printing Ink and Related Materials)

2000-01

I

Manufacturer's Name: Sun Chemical Corporation (General Printing Ink)

Emergency Phone No: (201) 933-4500

Street Address (No., City, State, Zip): 631 Central Avenue Carlstadt, New Jersey 07072

Product Class: Solvent Based Packaging Gravure

Trade Name:

Manufacturers Code: (See Attached List)

II Hazardous Ingredients

Material or Component in Hazardous Concentrations:	Hazard Data:
toluene	TLV 100 ppm (flammable liquid)
isopropyl alcohol	TLV 400 ppm (flammable liquid)
ethanol	TLV 1000 ppm (flammable liquid)
isopropyl acetate	TLV 250 ppm (flammable liquid)
n-propyl acetate	TLV 200 ppm (flammable liquid)

III Health Effect Information

Eye Contact: Can cause severe irritation.

Skin Contact: Prolonged or repeated contact can cause moderate irritation, defatting, dermatitis.

Inhalation: Excessive inhalation may cause respiratory tract irritation, headach dizziness, impaired coordination, severe narcosis or even asphyxiati Long term inhalation of excessive vapors may result in brain cell damage.

Ingestion: May cause gastrointestinal irritation, nausea, vomiting, Aspiration into the lungs may cause chemical pneumonitis and pulmonary edema/ hemorrhage.

Health Data: Overexposure to aromatic hydrocarbons has been found to cause the following effects in laboratory animals: liver abnormalities, kidney damage, lung damage, spleen damage.

Systemic Effects: Overexposure to aromatic hydrocarbons has been suggested as a cause of the following in humans: liver abnormalities.

See Disclaimer of Warranty on Page 3.

IV Emergency & First Aid Procedures

Eye Contact: Flush with water for 15 minutes. If irritation develops consult a physician.

Skin Contact: Wash with soap and water. Remove any contaminated clothing and launder before reusing.

Innalation: Remove affected person to fresh air. If necessary administer oxygen and consult a physician.

Ingestion: Do not induce vomiting - immediately consult a physician.

V Personal Health Protection Information

Eye Protection: Safety glasses or goggles recommended to prevent accidental contact.

Skin Protection: Impervious gloves should be worn for repeated or prolonged contact situations.

Ventilation: Sufficient to maintain TLV's. (See Section II)

Respiratory Protection: Where TLV's are not exceeded, none required. However, if TLV's are greatly exceeded, appropriate respiratory equipment should be supplied.

Other: Eye bath and safety shower are recommended.

VI Fire & Explosion Data

Flash Point Category (NFPA):	Lowest Flash Point:	Lower Explosion Limit:
IB	approximately 40°F	approximately 1.5%

Extinguishing Media: Carbon dioxide, dry chemical or foam.

Special Fire Fighting Procedure: Self-contained breathing apparatus and protective clothing should be worn in chemical fires.

Unusual Fire & Explosion Hazards: Can ignite explosively.

MATERIAL SAFETY DATA SHEET

VII Reactivity Data

Stability (thermal, light, etc.):	Stable	X	Conditions to Avoid	heat, spark and open flames
	Unstable			
Incompatibility (materials to avoid):	Strong alkalies, acid or oxidizing agents			

VIII Physical Data

Boiling Range: 130 - 232°F	Lbs. Gal. Range 7 - 12		Appearance: colored fluid		Type of Odor: characteristic of solvent
Vapor Density: Heavier X / Lighter	vs. air		Evaporation Rate vs. Butyl Acetate:	Faster / Slower X	
Liquid Density: Heavier X / Lighter	= vs. water		Percent Volatile Wt.:	range 40 - 80%	

IX Environmental Precautions

Procedure When Material is Spilled or Released: Eliminate all sources of ignition, use suitable protective equipment. Clean up with absorbent material.

Waste Disposal Method: In accordance with federal, state and local regulations.

X Special Precautions

Handling and Storage Requirements: Keep containers closed in a cool, well ventilated area.

Precautionary Statements: Avoid contact with eyes, skin and clothing. Keep away from heat, sparks and open flame.

Approved By: Date: 12/10/85

MSDS FOR VARNISH

BEST AVAILABLE COPY

K902

MATERIAL SAFETY DATA SHEET
FOR PRINTING INK AND RELATED MATERIALS

INFORMATION ON THIS FORM IS PROPRIETARY INFORMATION AND FURNISHED SOLELY FOR THE USE OF OUR CUSTOMERS

DATE OF PREP. 11/21/85 PREPARED BY H. E. Schepers

HAZARD RATINGS
Minimal 0
Slight 1
Moderate 2
Serious 3
Severe 4

HEALTH	3
FLAMMABILITY	3
REACTIVITY	0

KJ-902

Section I

MANUFACTURER'S NAME: INMONT CORPORATION
STREET ADDRESS: 36 TRIANGLE PARK
TRADE NAME: OIL CANNISTER
CITY, STATE AND ZIP CODE: CINCINNATI, OHIO 45246
PRODUCT CLASS: SOLVENT INK OR LACQUER
EMERGENCY TELEPHONE NUMBERS:
(513) 771-5888 H.E. Schepers
(201) 365-3512 Environmental Health Dept.
(800) 424-9300 CHEMTREC

Varnish KJ902

MANUFACTURER'S CODE IDENTIFICATION:

Section II - HAZARDOUS INGREDIENTS

Ingredient	CAS NO.	Hazard Data: TLV/PPM
ETHANOL	64-17-5	1000
METHANOL	67-56-1	200
ETHYL ACETATE	141-78-6	400

Section III - PHYSICAL DATA

BOILING RANGE °F	VAPOR DENSITY: HEAVIER ☑ vs. air LIGHTER ☐	LIQUID DENSITY: HEAVIER ☐ vs. water LIGHTER ☒
147 - 173		
APPEARANCE: COLORLESS LIQUID	EVAPORATION RATE: FASTER ☒ vs. Butyl Acetate SLOWER ☐	TYPE OF ODOR: ORGANIC SOLVENTS

Section IV - FIRE & EXPLOSION DATA

FLAMMABILITY CLASSIFICATION		FLASH POINT RANGE °F (Method Used)	LOWEST LEL VOL %
OSHA I B DOT FLAMMABLE		24-55 TCC	2.2

EXTINGUISHING MEDIA:
☒ FOAM ☐ "ALCOHOL" FOAM ☒ CO_2 ☒ DRY CHEMICAL ☐ WATER FOG ☐ OTHER

UNUSUAL FIRE AND EXPLOSION HAZARDS: VAPORS MAY IGNITE EXPLOSIVELY. VAPORS MAY SPREAD LONG DISTANCES. EXPOSURE OF CLOSED CONTAINERS TO EXCESS HEAT DURING FIRE MAY CAUSE DISRUPTIVE PRESSURE.

SPECIAL FIREFIGHTING PROCEDURES: USE WATER TO KEEP CLOSED CONTAINERS COOL

6.2 % VOC by weight per manufacturer

EFFECTS OF OVEREXPOSURE

Eye contact will cause irritation. Skin contact will cause defatting which can lead to dermatitis. Inhalation of vapors can cause headache, nausea and irritation of nose and throat. Chronic exposure above the TLV can cause injury to the central nervous system and can cause other systemic effects.

PRIMARY ROUTE(S) OF ENTRY: ☒ DERMAL ☒ INHALATION

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT - Flush with water for 15 minutes-if irritation persists, get medical attention.
SKIN CONTACT - Wash well with soap and water - use suitable handcream.
INHALATION - Remove individual to fresh air. INGESTION - Call physician immediately.

Section VI - REACTIVITY DATA

PRODUCT STABILITY ☒ STABLE ☐ UNSTABLE

CONDITIONS TO AVOID Avoid contact with strong acids or oxidizers.

Section VII - SPILL OR LEAK PROCEDURES

PROCEDURE WHEN MATERIAL SPILLED OR RELEASED

Eliminate all sources of vapor ignition. Ventilate area.
Remove by using suitable inert absorbing material.

WASTE DISPOSAL METHOD In accordance with applicable local, State and Federal regulations.

Section VIII - SPECIAL PROTECTION INFORMATION

VENTILATION Use sufficient local and general ventilation to maintain vapor concentrations below stated TLV's and LEL.

PROTECTIVE GLOVES

EYE PROTECTION Gloves and goggles or face shield should be worn during handling procedures where splashing is possible.

RESPIRATORY PROTECTION None required under normal operating conditions.

OTHER PROTECTIVE EQUIPMENT Protective clothing to prevent body contact.

Section IX - SPECIAL PRECAUTIONS

HANDLING AND STORING Keep containers closed when not in use.
Keep away from excess heat.

OTHER PRECAUTIONS

BEST AVAILABLE COPY

W 42981

MATERIAL SAFETY DATA SHEET

FOR PRINTING INK AND RELATED MATERIALS

INFORMATION ON THIS FORM IS PROPRIETARY INFORMATION AND FURNISHED SOLELY FOR THE USE OF OUR CUSTOMERS

DATE OF PREP. 10/21/1995 PREPARED BY H. E. Schepers

HAZARD RATINGS
Minimal 0
Slight 1
Moderate 2
Serious 3
Severe 4

HEALTH	3
FLAMMABILITY	3
REACTIVITY	0

Section I

MANUFACTURER'S NAME: INMONT CORPORATION

STREET ADDRESS: 36 TRIANGLE PARK

TRADE NAME: 42000 PROMONT

CITY, STATE AND ZIP CODE: CINCINNATI, OHIO 45246

PRODUCT CLASS: SOLVENT INK OR LACQUER

Varnish NB1064

EXTENDER

EMERGENCY TELEPHONE NUMBERS:
(513) 771-5888 H.E. Schepers
(201) 365-3512 Environmental Health Dept.
(800) 424-9300 CHEMTREC

MANUFACTURER'S CODE IDENTIFICATION:

Section II - HAZARDOUS INGREDIENTS

Ingredient	CAS NO.	Hazard Data: TLV/PPM
Ethanol	64-17-5	1000
Methanol	67-56-1	200
Isopropanol	67-63-0	400
n-Propanol	71-23-8	200
Ethyl Acetate	141-78-6	400
n-Propyl Acetate	109-60-4	200
n-Heptane	142-82-5	400
V.M.&P. Naptha	8030-30-6	300

Section III - PHYSICAL DATA

BOILING RANGE °F	VAPOR DENSITY: HEAVIER ☒	LIQUID DENSITY: HEAVIER ☐
147 - 244	vs. air LIGHTER ☐	vs. water LIGHTER ☒
APPEARANCE	**EVAPORATION RATE FASTER ☒**	**TYPE OF ODOR**
COLORED LIQUID	vs. Butyl Acetate SLOWER ☐	ORGANIC SOLVENTS

Section IV - FIRE & EXPLOSION DATA

FLAMMABILITY CLASSIFICATION		FLASH POINT RANGE °F (Method Used)	LOWEST LEL VOL %
	OSHA I B	24 - 77	1.0
	DOT FLAMMABLE	TCC	

EXTINGUISHING MEDIA:

☒ FOAM ☐ "ALCOHOL" FOAM ☒ CO_2 ☒ DRY CHEMICAL ☐ WATER FOG ☐ OTHER

UNUSUAL FIRE AND EXPLOSION HAZARDS VAPORS MAY IGNITE EXPLOSIVELY. VAPORS MAY SPREAD LONG DISTANCES. EXPOSURE OF CLOSED CONTAINERS TO EXCESS HEAT DURING FIRE MAY CAUSE DISRUPTIVE PRESSURE.

SPECIAL FIREFIGHTING PROCEDURES

USE WATER TO KEEP CLOSED CONTAINERS COOL.

42 % VOC by weight per manufacturer

EXTENDER

Section V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE

Eye contact will cause irritation. Skin contact will cause defatting which can lead to dermatitis. Inhalation of vapors can cause headache, nausea and irritation of nose and throat. Chronic exposure above the TLV can cause injury to the central nervous system and can cause other systemic effects.

PRIMARY ROUTE(S) OF ENTRY: ☒ DERMAL ☒ INHALATION

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT - Flush with water for 15 minutes-if irritation persists, get medical attention.
SKIN CONTACT - Wash well with soap and water - use suitable handcream.
INHALATION - Remove individual to fresh air. INGESTION - Call physician immediately.

Section VI - REACTIVITY DATA

PRODUCT STABILITY ☒ STABLE ☐ UNSTABLE

CONDITIONS TO AVOID Avoid contact with strong acids or oxidizers.

Section VII - SPILL OR LEAK PROCEDURES

PROCEDURE WHEN MATERIAL SPILLED OR RELEASED

Eliminate all sources of vapor ignition. Ventilate area.
Remove by using suitable inert absorbing material.

WASTE DISPOSAL METHOD In accordance with applicable local, State and Federal regulations.

Section VIII - SPECIAL PROTECTION INFORMATION

VENTILATION Use sufficient local and general ventilation to maintain vapor concentrations below stated TLV's and LEL

PROTECTIVE GLOVES

EYE PROTECTION Gloves and goggles or face shield should be worn during handling procedures where splashing is possible.

RESPIRATORY PROTECTION None required under normal operating conditions.

OTHER PROTECTIVE EQUIPMENT Protective clothing to prevent body contact.

Section IX - SPECIAL PRECAUTIONS

HANDLING AND STORING Keep containers closed when not in use.
Keep away from excess heat.

OTHER PRECAUTIONS

MSDS FOR SOLVENTS

MATERIAL SAFETY DATA SHEET

EASTMAN CHEMICAL PRODUCTS, INC.
Kingsport, Tennessee 37662

For Health Hazard Information, call: (615) 229-6094, 8am-5pm (Eastern), Mon.-Fri.
(615) 229-4374 at all other times

For other information, call: (615) 229-2291 Date of Preparation: 04-11-83

Approved by U. S. Department of Labor: Essentially Similar to OSHA-20

SECTION I. IDENTIFICATION

- Product Name: **TECSOL® C Special Industrial Solvent, Anhydrous**
- Synonym: Denatured ethyl alcohol
- Formula: Mixture

SECTION II. PRODUCT AND COMPONENT HAZARD DATA

A. COMPONENTS:	Approx. Percent	TLV**	CAS Reg. No.
*Ethanol	89	1000 ppm	64-17-5
*Ethyl acetate	5	400 ppm	141-78-6
*Methanol	5	200 ppm	67-56-1
*Methyl isobutyl ketone	1	50 ppm	108-10-1

*Principal hazardous components

**See Section VI-A for additional information on exposure limits.

B. PRECAUTIONARY LABEL STATEMENTS:

WARNING! FLAMMABLE
MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED
MAY BE HARMFUL IF INHALED OR ABSORBED THROUGH THE SKIN
CAUSES EYE IRRITATION

Keep away from heat, sparks, and flame.
Avoid breathing vapor.
Avoid contact with eyes, skin, and clothing.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.
If taken internally will cause serious consequences to health, or possibly death.

POISON
Call a Physician

FIRST AID: If swallowed, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

IN CASE OF FIRE: Use water spray, dry chemical, "alcohol" foam, or CO_2. Water may be ineffective in fighting the fire. Use water spray to keep fire-exposed containers cool.

IN CASE OF SPILL: Eliminate all ignition sources. Flush spill area with water spray. Prevent runoff from entering drains, sewers, and streams.

Since emptied packages retain product residue, follow label warnings even after package is emptied.

SECTION III. PHYSICAL DATA

- Appearance and Odor: Clear liquid, characteristic alcohol odor.
- Boiling Point: 78-80°C (172-176°F)
- Specific Gravity (H_2O = 1): 0.797 at 15.6°/15.6°C
- Vapor Pressure: Approx 100 mm Hg at 29°C (85°F)
- Percent Volatile by Volume: >99
- Vapor Density (Air = 1): 1.6
- Evaporation Rate (n-butyl acetate = 1): 1.9
- Solubility in Water: Complete.

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

- Flash Point: 10°C (50°F)
  Method Used: TCC
- Autoignition Temperature: 418°C (785°F); method used: ASTM D-2155
- Flammable Limits: LEL 3.2% at 38°C UEL 25.7% at 66°C
- Extinguishing Agent: Water Spray, Dry Chemical, CO_2, "Alcohol" Foam
- Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Water may be ineffective for fire fighting. Use water spray to keep fire-exposed containers cool.
- Unusual Fire and Explosion Hazards: Flammable liquid (see Section VIII). Vapors are heavier than air and may travel considerable distance to a source of ignition and flash back.

SECTION V. REACTIVITY DATA

- Stability: Stable.
- Incompatibility: Oxidizing materials can cause a vigorous reaction.
- Hazardous Decomposition Products: As with any other organic material, combustion will produce carbon dioxide and probably carbon monoxide.
- Hazardous Polymerization: Will not occur.

SECTION VI. TOXICITY AND HEALTH

A. EXPOSURE LIMITS

Exposure Limits for Hazardous Components (in ppm)

Component	ACGIH, 1982 TLV TWA	ACGIH, 1982 TLV STEL	ACGIH, 1982 Skin Notation	OSHA PEL TWA
Ethanol	1000	--	No	1000
Ethyl acetate	400	--	No	400
Methanol	200	250	Yes	200
Methyl isobutyl ketone	50	75	No	100

-NIOSH industrial hygiene analytical methods are available. (1)

B. EXPOSURE EFFECTS

General: Prolonged exposure to excessive concentrations of ethanol may result in irritation of mucous membranes, headache, drowsiness, fatigue, and narcosis. Methanol is also narcotic in effect and its effects are cumulative. Overexposure to methanol can result in acidosis and visual disturbances which may progress to permanent loss of vision. (2)

Inhalation: May be harmful if inhaled.

Eyes: Liquid or vapor may cause irritation.

Skin: May be harmful if absorbed through the skin.

Ingestion: May be fatal or cause blindness if swallowed.

C. FIRST AID

POISON! Get medical attention immediately.

Inhalation: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.

Eyes: Immediately flush with plenty of water for at least 15 minutes. Remove from airborne exposure, treat symptomatically, and get medical attention if symptoms persist.

Skin: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash contaminated clothing before reuse.

Ingestion: If conscious, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person.

D. ANIMAL TOXICITY DATA

Toxicity data for the major product components are as follows:

Ethanol

Test	Species	Result	Toxicity Classification (3)
Acute oral LD_{50}	Rat	6.2 to 17.8 g/kg (2)	Practically nontoxic
Acute oral LD_{50}	Mouse	8.3 to 9.5 g/kg (2)	Practically nontoxic
Acute oral LD_{50}	Guinea pig	5.6 g/kg (2)	Practically nontoxic
Acute oral LD_{50}	Rabbit	9.9 g/kg (2)	Practically nontoxic
Dermal LD_{50}	Rabbit	>9.4 mL/kg (4)	
Inhalation LC_{50}	Rat	ca. 16,000 ppm/8 h (2)	
Skin irritation	Rabbit	Slight (4)	
Repeated skin application	Rat	Slight (2)	
Eye irritation	Rabbit	Moderate (2)	

Inhalation of excessive levels of ethanol vapors for short durations can produce the following acute effects in experimental animals: mucous membrane irritation, excitation, ataxia, narcosis, drowsiness, prostration, twitching, general paralysis, dyspnea, and even death from respiratory failure. (2)

Rats given 10.2 g/kg/day of ethanol in their drinking water for 12 weeks showed a decrease in weight gain and fatty livers. Rats fed diets containing 33% ethanol for up to 14 weeks showed fatty liver change. A monkey fed a diet containing 40% ethanol for 3 months showed an excessive level of triglycerides, cholesterol, and phospholipids in the serum and liver, as well as increased levels of triglycerides and cholesterol esters in the heart. Rabbits exposed to air saturated with ethanol vapors for up to 365 days showed cirrhosis of the liver. Rats, guinea pigs, rabbits, monkeys, and dogs exposed to airborne concentrations of 86 mg/m^3 of ethanol continuously for 90 days showed no change in clinical behavior, mortality, hematology, gross pathology, or histopathology. (2)

Ethyl Acetate

Test	Species	Result
Acute oral LD_{50}	Rat	5600 mg/kg (5)
Acute oral LD_{50}	Mouse	440 mg/kg (5)
Dermal LD_{50}	Rabbit	>20 mL/kg (6)
Inhalation LC_{50}	Mouse	10,000 ppm/3/4 h (5)
Skin irritation	Rabbit	Slight
Eye irritation	Rabbit	Slight to moderate (6)

Methanol

Test	Species	Result
Acute oral LD_{50}	Rat	6200 mg/kg (2)
Acute oral LD_{50}	Rabbit	14,400 mg/kg (2)
Dermal LD_{50}	Rabbit	20 mL/kg (2)
Inhalation LC_{50}	Rat	>22,500 ppm/8 h (2)
Skin irritation	-	Slight (2)
Eye irritation	Rabbit	Slight (7)

NOTE: Methanol is toxic by oral ingestion, skin absorption, and inhalation and can produce degeneration of the central nervous system, atrophy of the optic nerve, and liver and kidney damage.

SECTION VII. PERSONAL PROTECTION AND CONTROLS

A. RESPIRATORY PROTECTION

An appropriate NIOSH-approved respirator for organic vapor should be worn if needed.

B. VENTILATION

General: Recommend at least ten air changes per hour for good general room ventilation.

Local Exhaust: If needed to control vapor. See Section VI-A for detailed information on exposure limits.

C. SKIN AND EYE PROTECTION

Safety glasses should be worn in any type of industrial operation. Protective gloves should be worn.

D. OTHER CONTROL MEASURES

A safety shower, an eye bath, and washing facilities should be available. Wash thoroughly after handling.

SECTION VIII. SPECIAL STORAGE AND HANDLING PRECAUTIONS

Material is classified as a Flammable Liquid. Keep away from heat, sparks, and flame. Keep container closed. Use with adequate ventilation.
Since emptied packages retain product residue, follow label warnings even after package is emptied.

SECTION IX. SPILL, LEAK, AND DISPOSAL PRACTICES

Steps to be Taken in Case Material is Released or Spilled: Eliminate all ignition sources. Small spills may be collected with absorbent materials. For large spills, flush area with water spray. Prevent runoff from entering drains, sewers, or streams.

Waste Disposal Method: Mix with compatible chemical which is less combustible and incinerate. Observe all federal, state, and local laws concerning health and environment.

SECTION X. ENVIRONMENTAL EFFECTS DATA

This solvent mixture has not been tested for environmental effects. However, some laboratory test data and published data are available for the major components of this solvent mixture, and these data have been used to provide the following estimate of environmental impact: (8, 9, 10, 11, 12, 13)

This solvent mixture is expected to have a high biological oxygen demand, and it is expected to cause significant oxygen depletion in aquatic systems. It is expected to have a low potential to affect aquatic organisms and secondary waste treatment microorganisms. This solvent mixture is readily biodegradable and is not likely to bioconcentrate. If diluted with a large amount of water, a moderate quantity of this solvent released directly or indirectly into the environment is not expected to have a significant impact.

SECTION XI. TRANSPORTATION

DOT Hazard Classification: Flammable Liquid.
Hazardous component(s): See Section IIA.
Flashpoint: See Section IV.

SECTION XII. REFERENCES

Unless noted, toxicity results are from unpublished data, Health, Safety, and Human Factors Laboratory, Eastman Kodak Co., Rochester, New York.

1. NIOSH Manual of Analytical Methods, 2nd Edition. Issued by the National Institute for Occupational Safety and Health. Washington, U. S. Government Printing Office, 1977.

2. G. D. Clayton and F. E. Clayton, Editors. Patty's Industrial Hygiene and Toxicology, 3rd Revised Edition, Volume 2C. New York, Wiley-Interscience, 1982, pp. 4528-4556.

3. H. C. Hodge and J. H. Sterner. Tabulation of toxicity classes. Am. Ind. Hyg. Assoc. Q. 1949; 10:93-96.

4. F. A. Patty, Editor. Industrial Hygiene and Toxicology, 2nd Revised Edition, Volume II. New York, Wiley-Interscience, 1963, pp. 1422-1433.

MATERIAL SAFETY DATA SHEET

OCT 3 1 1989

EASTMAN CHEMICAL PRODUCTS, INC.
Kingsport, Tennessee 37662

For Health Hazard Information, call: (615) 229-6094, 8am-5pm (Eastern), Mon.-Fri.
(615) 229-4374 at all other times

For other information, call: 229-3339 Date of Preparation: 05-17-83

Approved by U. S. Department of Labor: Essentially Similar to OSHA-20

SECTION I. IDENTIFICATION

- Product Name: **EASTMAN® Ethyl Acetate, 99%**

- Synonym: Acetic acid, ethyl ester
- Formula: $CH_3COOC_2H_5$
- Molecular Weight: 88.11

SECTION II. PRODUCT AND COMPONENT HAZARD DATA

A. COMPONENT:	Approx. Percent	TLV**	CAS Reg. No.
*Ethyl acetate	99	400 ppm	141-78-6
*Ethanol	1	1000 ppm	64-17-5

*Principal hazardous components
**See Section VI-A for additional information on exposure limits.

B. PRECAUTIONARY LABEL STATEMENTS:

WARNING! FLAMMABLE

Keep away from heat, sparks, and flame.
Avoid prolonged breathing of vapor.
Keep container closed.
Use with adequate ventilation.

IN CASE OF FIRE: Use water spray, dry chemical, "alcohol" foam, or CO_2. Water may be ineffective in fighting the fire. Use water spray to keep fire-exposed containers cool.

IN CASE OF SPILL: Eliminate all ignition sources. Flush spill area with water spray. Prevent runoff from entering drains, sewers, and streams. Use water spray to disperse vapors.

Since emptied packages retain product residue, follow label warnings even after package is emptied.

SECTION III. PHYSICAL DATA

- Appearance and Odor: Clear volatile liquid, characteristic fruity odor.
- Boiling Point: 75.5°C (167°F)
- Melting Point: -83.6°C (-118.5°F)
- Specific Gravity (H_2O = 1): 0.901 at 20°/20°C
- Vapor Pressure: 86 mm Hg at 20°C
- Percent Volatile by Volume: >99
- Vapor Density (Air = 1): 3.04
- Evaporation Rate (Butyl acetate = 1): 4.1
- Solubility in Water: 7.4%; moderate.

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

- Flash Point: -4°C (24°F)
  Method Used: TCC
- Autoignition Temperature: 485°C (905°F); ASTM D 2155
- Flammable Limits: LEL 2.02% at 38°C UEL 10.7% at 38°C
- Extinguishing Agent: Dry Chemical, CO_2, "Alcohol" Foam, or Water Spray
- Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Water may be ineffective for fire fighting. Use water spray to keep fire-exposed containers cool.
- Unusual Fire and Explosion Hazards: Flammable liquid (see Section VIII). Vapors are heavier than air and may travel considerable distance to a source of ignition and flash back.

SECTION V. REACTIVITY DATA

- Stability: Stable.
- Incompatibility: Oxidizing materials can cause a vigorous reaction.
- Hazardous Decomposition Products: As with any other organic material, combustion will produce carbon dioxide and probably carbon monoxide.

SECTION VI. TOXICITY AND HEALTH

A. EXPOSURE LIMITS

- OSHA Permissible Exposure Limit (PEL): Ethyl acetate: 400 ppm-TWA; Ethanol: 1000 ppm-TWA.
- Threshold Limit Value (TLV): Ethyl acetate: 400 ppm-TWA; Ethanol: 1000 ppm-TWA, ACGIH, 1982.
- NIOSH industrial hygiene analytical methods are available for ethyl acetate and ethanol. (1)

B. EXPOSURE EFFECTS

Inhalation: High concentrations of vapor cause upper respiratory tract irritation and narcosis (sleepiness, drowsiness, etc.).

Eyes: Liquid and vapor may cause irritation.

Skin: Prolonged or repeated contact may cause drying, cracking, or irritation of the skin.

Human patch testing of ethyl acetate showed no irritation after a 48-h closed patch test. A maximization test on 25 humans produced no sensitization reactions. (2)

C. FIRST AID

Inhalation: Remove from exposure, treat symptomatically, and get medical attention if symptoms persist.

Eyes: Any material gotten into the eye should be washed out immediately and medical attention obtained if symptoms are present after washing.

D. TOXICITY DATA

Ethyl Acetate

Test	Species	Result	Toxicity Classification (3)
Acute oral LD_{50}	Rat	5.60 g/kg (4)	Practically nontoxic
Acute oral LD_{50}	Mouse	0.44 g/kg (4)	Moderately toxic
Acute oral LD_{50}	Rabbit	4.94 g/kg (4)	Slightly toxic
Dermal LD_{50}	Rabbit	>20 mL/kg (5)	Practically nontoxic
Inhalation LC_{50}	Rat	>8,000 ppm/4 h (5)	Slightly toxic
Inhalation LC_{100}	Rat	16,000 ppm/4 h (5)	
Inhalation LC_{50}	Mouse	10,000 ppm/3/4 h (4)	
Skin irritation	Rabbit	Slight (5)	
Eye irritation	Rabbit	Slight (5)	

Guinea pigs exposed to 2000 ppm ethyl acetate for 4 h/day, 6 days/wk showed no evidence of harm after 65 exposures. Mice were narcotized but recovered from 3 to 4 h exposure to 5000 ppm. Cats exposed to 9200 ppm demonstrated salivation and coughing, and exposure to 17,000 ppm was lethal. (6) Deaths were attributed to pulmonary edema, hemorrhage, and hyperemia of the respiratory tract. Repeated exposure of rabbits to 4450 ppm for 1 h/day for 40 days resulted in secondary anemia with leucocytosis, hyperemia, cloudy swelling, and fatty degeneration of various organs. (6)

Human subjects have found ethyl acetate irritating at 400 ppm, but industrial experience indicates that higher concentrations can be tolerated. No anesthetic symptoms occur at 400 to 600 ppm even with 2 to 3 h exposure. A concentration of 8,600 to 20,000 ppm has been considered dangerous to humans for short exposures. (6)

SECTION VII. PERSONAL PROTECTION AND CONTROLS

A. RESPIRATORY PROTECTION

An appropriate NIOSH-approved respirator for organic vapor should be worn if needed.

B. VENTILATION

General: Recommend at least ten air changes per hour for good general room ventilation.

Local Exhaust: If needed to control vapor. See Section VI-A for detailed information on exposure limits.

C. SKIN AND EYE PROTECTION

Safety glasses should be worn in any type of industrial operation.

SECTION VIII. SPECIAL STORAGE AND HANDLING PRECAUTIONS

Material is classified as a Flammable Liquid. Keep away from heat, sparks, and flame. Keep container closed. Use with adequate ventilation.

Since emptied packages retain product residue, follow label warnings even after package is emptied.

SECTION IX. SPILL, LEAK, AND DISPOSAL PRACTICES

Steps to be Taken in Case Material is Released or Spilled: Eliminate all ignition sources. Small spills may be collected with absorbent materials. For large spills, flush area with water spray. Prevent runoff from entering drains, sewers, or streams.

Waste Disposal Method: Incineration. Observe all federal, state, and local laws concerning health and environment.

SECTION X. ENVIRONMENTAL EFFECTS DATA

A. SUMMARY: This product has been tested for environmental effects. Some laboratory test data and published data (7-10) are available for this product, and these data have been used to provide the following estimate of environmental impact:

This product has a high biological oxygen demand, and it is expected to cause significant oxygen depletion in aquatic systems. It has a low potential to affect aquatic organisms. This product is readily biodegradable and is not likely to bioconcentrate. If diluted with a large amount of water, this product released directly or indirectly into the environment is not expected to have a significant impact.

B. OXYGEN DEMAND DATA

- COD: 1.54 g/g (7)
- BOD_5: 1.24 g/g (7)

C. ACUTE AQUATIC EFFECTS

- 96-hour LC_{50}; Water flea: 2500 mg/L (8)
- 48-hour LC_{50}; Golden orfe (minnow): 333 mg/L*; 270 mg/L*

*Results of the same test carried out in two different laboratories. (9)

D. BIOCONCENTRATION POTENTIAL

- Octanol/water partition coefficient: $Log_{10}P$ reported to be 0.73 and 0.66. (10)

SECTION XI. TRANSPORTATION

DOT Hazard Classification: Flammable liquid
Hazardous Components: See Section IIA.
Flashpoint: See Section IV.

SECTION XII. REFERENCES

Unless noted, toxicity results are from unpublished data, Health, Safety, and Human Factors Laboratory, Eastman Kodak Co., Rochester, New York.

1. NIOSH Manual of Analytical Methods, 2nd Edition, Volume 2. Issued by the National Institute for Occupational Safety and Health. Washington, U. S. Government Printing Office, 1977, Methods S49 and S56.

2. D.L.J. Opdyke. Monographs on fragrance raw materials. Food Cosmet. Toxicol. 1974; 12:711.

3. H. C. Hodge and J. H. Sterner. Tabulation of toxicity classes. Am. Ind. Hyg. Assoc. Q. 1949; 10:93-96.

4. G. D. Clayton and F. E. Clayton, Editors. Patty's Industrial Hygiene and Toxicology, 3rd Revised Edition, Volume 2A. New York, Wiley-Interscience, 1981, pp. 2270-2277.

5. H. F. Smyth, Jr., et al. Range-finding toxicity data. Am. Ind. Hyg. Assoc. J. 1962; 23:100.

6. American Industrial Hygiene Association, Hygienic Guide Series.

7. K. Verschueren. Handbook of Environmental Data on Organic Chemicals. New York, Van Nostrand Reinhold Company, 1977, pp. 301-303.

8. V. G. Bringmann and R. Kuehn. Results of the damaging effect of water pollutants on Daphnia magna. Z. Wasser Abwasser Forsch. 1977; 10(5):161-166 (in German).

9. I. Juhnke and D. Luedemann. Results of the study of 200 chemical compounds on acute fish toxicity using the golden orfe test. Z. Wasser Abwasser Forsch. 1978; 11(5):161-164 (in German).

EFFECTIVE DATE: APRIL 1, 1985

I. IDENTIFICATION

PRODUCT NAME:	n-PROPANOL		
CHEMICAL NAME:	--	CHEMICAL FAMILY:	Alcohols
FORMULA:	C_3H_7OH	MOLECULAR WEIGHT:	60.10
SYNONYMS:	1-Propanol; n-Propyl Alcohol; Ethyl Carbinol		
DEPARTMENT OF TRANSPORTATION	Hazard Classification Shipping Name	Flammable Liquid Propyl Alcohol	
CAS # 71-23-8	CAS NAME	1-Propanol	

II. PHYSICAL DATA

BOILING POINT, 760 mm Hg	97.2°C (207.0°F)	FREEZING POINT	-126.2°C (-195.2°F)
SPECIFIC GRAVITY (H_2O = 1)	0.8045 at 20/20°C	VAPOR PRESSURE at 20°C	14.9 mm Hg
VAPOR DENSITY (air = 1)	2.1	SOLUBILITY IN WATER, % by wt.	100
PERCENT VOLATILES BY VOLUME	100	EVAPORATION RATE (Butyl Acetate = 1)	1.3
APPEARANCE AND ODOR	Water-white liquid; mild and nonresidual odor.		

III. INGREDIENTS

MATERIAL	%	TLV	HAZARD
1-Propanol	100	200 ppm (skin)	Eye irritant; flammable; Harmful if inhaled.

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	76°F, Tag Closed Cup; 81°F, Tag Open Cup			
FLAMMABLE LIMITS IN AIR, % by volume	LOWER	2.1	UPPER	13.7
EXTINGUISHING MEDIA	Water spray or alochol-type foam applied by manufacturers' recommended techniques for large fires; carbon dioxide or dry chemical for small spill fires.			
SPECIAL FIRE FIGHTING PROCEDURES	Addition of water spray (fog) will reduce the intensity of the flames. Use self-contained breathing apparatus and protective clothing.			
UNUSUAL FIRE AND EXPLOSION HAZARDS	Vapors form from this product and may travel or be moved by air currents and ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equip., static discharges, or other ignition sources at locations distant from handling point.			

EMERGENCY PHONE NUMBER • 304/744-3487 • This number is available days, nights, weekends, and holidays.

VI. REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID	Heat; fire; ignition sources
UNSTABLE	STABLE		
	X		

INCOMPATIBILITY (materials to avoid)	Avoid concentrated nitric and sulfuric acids, strong oxidizers, aldehydes, halogens, and halogen compounds.
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS	Burning can produce carbon monoxide and/or carbon dioxide.

HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID	None
May Occur	Will Not Occur		
	X		

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED	Extinguish and do not turn on any igntion source until area is determined to be free from explosion or fire hazards. Collect large spills for disposal. Flush small spills with water.
WASTE DISPOSAL METHOD	Incinerate in a furnace where permitted under appropriate Federal, State, and local regulations. See Section IX.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION	Self-contained breathing apparatus in high concentrations.
VENTILATION	This product should be confined within closed equipment, in which case general (mechanical) room ventilation should be satisfactory. Special, local ventilation is needed at points where vapors can be expected to escape to the workplace air.

PROTECTIVE GLOVES	Nitrile	EYE PROTECTION	Monogoggles
OTHER PROTECTIVE EQUIPMENT	Eye bath, safety shower		

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Keep away from heat, sparks, and flame. Avoid breathing vapor. Do not get in eyes.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

FOR INDUSTRY USE ONLY

OTHER PRECAUTIONS
DISPOSAL: At very low concentrations in water (~10 ppm), n-propanol is readily biodegradable in a biological wastewater treatment plant.

V. HEALTH HAZARD DATA

TLV AND SOURCE:

200 ppm (skin); ACGIH, 1984-5; OSHA 29 CRF, para. 1910.1000.

EFFECTS OF ACUTE OVEREXPOSURE

SWALLOWING	Moderately toxic; may cause nausea, vomiting, cramps, diarrhea, abdominal pain, drowsiness, dizziness and incoordination.
SKIN ABSORPTION	No evidence of adverse effects from available information
INHALATION	Vapors are irritating. High concentrations may cause nausea, headache, dizziness, and incoordination.
SKIN CONTACT	Prolonged contact may cause minimal irritation.
EYE CONTACT	Causes severe irritation with possible conjunctivitis, iritis, and corneal injury. Corneal burns are possible if untreated.

EFFECTS OF REPEATED OVEREXPOSURE

No evidence of adverse effects from available information.

OTHER HEALTH HAZARDS

None currently known.

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING	Give two glasses of water and induce vomiting. Call a physician.
SKIN	Flush with water.
INHALATION	Remove to fresh air. Administer artifical respiration if breathing has stopped. Call a physician.
EYES	Immediately flush eyes thoroughly with water for at least 15 minutes. Seek medical attention without delay.

NOTES TO PHYSICIAN

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition.

MATERIAL SAFETY DATA SHEET

EFFECTIVE DATE: APRIL 1, 1985

Union Carbide Corporation urges the customer receiving this Material Safety Data Sheet to study it carefully to become aware of hazards, if any, of the product involved. In the interest of safety you should (1) notify your employees, agents, and contractors of the information on this sheet, (2) furnish a copy to each of your customers for the product, and (3) request your customers to inform their employees and customers as well.

I. IDENTIFICATION

PRODUCT NAME:	n-PROPYL ACETATE		
CHEMICAL NAME:	n-Propyl Acetate	CHEMICAL FAMILY:	Esters
FORMULA:	$CH_3COOC_3H_7$	MOLECULAR WEIGHT:	102.13
SYNONYMS:	Acetic Acid, Propyl Ester		
DEPARTMENT OF TRANSPORTATION	Hazard Classification Shipping Name	Flammable Liquid Propyl Acetate	
CAS # 109-6-4	CAS NAME	Acetic Acid, 1-Propyl Ester	

II. PHYSICAL DATA

BOILING POINT, 760 mm Hg	101.6°C (214.9°F)	FREEZING POINT	-95.0°C (-139.0°F)
SPECIFIC GRAVITY (H_2O = 1)	0.8883 at 20/20°C	VAPOR PRESSURE at 20°C	25 mm Hg
VAPOR DENSITY (air = 1)	3.5	SOLUBILITY IN WATER, % by wt.	2.0 at 20°C
PERCENT VOLATILES BY VOLUME	100	EVAPORATION RATE (Butyl Acetate = 1)	2.75
APPEARANCE AND ODOR	Water-white liquid; mild and nonresidual odor		

III. INGREDIENTS

MATERIAL	%	TLV	HAZARD
Propyl Acetate	100	200 ppm	Flammable; Irritant

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	58°F, Tag Closed Cup; 65°F, Tag Open Cup			
FLAMMABLE LIMITS IN AIR, % by volume	LOWER	1.7 at 100°F	UPPER	8.0
EXTINGUISHING MEDIA	Use water spray, carbon dioxide, dry chemical, alcohol-type, or universal-type foams applied by manufacturers' recommended techniques.			
SPECIAL FIRE FIGHTING PROCEDURES	Use supplied breathing air and protective clothing.			
UNUSUAL FIRE AND EXPLOSION HAZARDS	Vapors form from this product and may travel or be moved by air currents and ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equip., static discharges, or other ignition sources at locations distant from handling point.			

EMERGENCY PHONE NUMBER • 304/744-3487 • This number is available days, nights, weekends, and holidays.

V. HEALTH HAZARD DATA

TLV AND SOURCE:

See Section III. Values from ACGIH 1984-5; OSHA CFR 29, para. 1910.1000, Table Z-1.

EFFECTS OF ACUTE OVEREXPOSURE

SWALLOWING	May cause nausea, vomiting, and diarrhea.
SKIN ABSORPTION	No evidence of adverse effects from available information.
INHALATION	Vapors may be irritating and cause dizziness, headache, nausea, and vomiting.
SKIN CONTACT	Brief contact should not produce harmful effects, but prolonged contact, as from clothing wet with the chemical, may cause irritation.
EYE CONTACT	Causes irritation.

EFFECTS OF REPEATED OVEREXPOSURE

No evidence of adverse effects from available information.

OTHER HEALTH HAZARDS

None currently known.

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING	Give two glasses of water and induce vomiting.
SKIN	Remove contaminated clothing and flush skin with water.
INHALATION	Remove to fresh air. Call a physician. Give artificial respiration if not breathing, oxygen if breathing is difficult.
EYES	Flush with plenty of water. Call a physician if discomfort persists.

NOTES TO PHYSICIAN
Treatment should be directed at the control of symptoms and the clinical condition. There is no specific antidote.

VI. REACTIVITY DATA

STABILITY			
UNSTABLE	STABLE	CONDITIONS TO AVOID	Heat; sparks; ignition sources
	X		

INCOMPATIBILITY (materials to avoid)	Avoid alkali metal hydroxides, such as sodium hydroxide.
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS	Burning can produce carbon monoxide and/or carbon dioxide.

HAZARDOUS POLYMERIZATION			
May Occur	Will Not Occur	CONDITIONS TO AVOID	None
	X		

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED	Extinguish and do not turn on any ignition source until area is determined to be free from explosion or fire hazards. Collect large spills for disposal. Flush small spills with water. See Section IX.
WASTE DISPOSAL METHOD	Incinerate in a furnace where permitted under Federal, State, and local regulations.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION	Self-contained breathing apparatus in high concentrations.
VENTILATION	This product should be confined within covered equipment, in which case general (mechanical) room ventilation is expected to be satisfactory. Special, local ventilation is recommended at points where vapors can be expected to escape to the workplace air.

PROTECTIVE GLOVES	Rubber or plastic	EYE PROTECTION	Safety glasses
OTHER PROTECTIVE EQUIPMENT	Eye bath; safety shower		

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Avoid breathing vapor. Keep away from heat, sparks, and flame. Avoid contact with eyes, skin, and clothing. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

FOR INDUSTRY USE ONLY

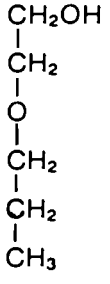
OTHER PRECAUTIONS
Toxic to fish! Avoid discharge to natural waters.

Eastman CHEMICALS

Publication No. M-198C
May 1983

EKTASOLVE® EP
ethylene glycol monopropyl ether

CAS No. 2807-30-9



Typical Properties[a]

Molecular Weight ($C_5H_{12}O_2$)	104.15
Color (Pt-Co Scale), max	10
Weight/Vol at 20° C,	
lb/gal (U.S.)	7.59
kg/L	0.91
lb/gal (Imperial)	9.1
Solubility at 20° C, wt %	
In water	Complete
Water in	Complete
Evaporation Rate (n-butyl acetate = 1)	0.22
Dilution Ratio,	
Toluene	4.0
VM & P naphtha	2.0
Refractive Index at 20° C	1.4136
Vapor Pressure at 20° C, mm Hg	1.3
Specific Gravity at 20°/20° C	0.9125
Boiling Range at 760 mm, °C	
Initial Boiling Point, min	149.5
Dry Point, max	153.5
Freezing Point, °F (°C)	Below -130 (-90)
Flash Point by Tag Closed Cup, °F (°C)	120 (49)
Tag Open Cup, °F (°C)	133 (56)
Fire Point, °F (°C)	133 (56)
Flammable Limits in Air, % by volume	
Lower at 156° F (69° C)	1.26
Upper at 260° F (127° C)	15.8
Autoignition Temperature (ASTM D 2155), °F (°C)	455 (235)
NFPA Classification 30	II
DOT Classification	Combustible Liquid
DOT Labels Required	None

[a] *The properties reported here are typical of average lots. Eastman makes no representation that the material in any particular shipment will conform exactly to the values listed.*

EASTMAN CHEMICAL PRODUCTS, INC., Kingsport, Tennessee
EASTMAN CHEMICAL INTERNATIONAL COMPANY, Kingsport, Tennessee
EASTMAN CHEMICAL INTERNATIONAL A.G., Zug, Switzerland
EASTMAN CHEMICAL INTERNATIONAL LTD., Kingsport, Tennessee
EASTMAN CHEMICAL BRASILEIRA LTDA., Sao Paulo, Brazil
Marketing affiliates of Eastman Kodak Company

FOR ADDITIONAL INFORMATION
About EASTMAN Chemicals, Fibers, and Plastics

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The UNITED STATES Except states listed below	**EASTMAN CHEMICAL PRODUCTS, INC.***	Toll-free (800) 251-0351
	P. O. Box 431	(From within Tennessee, call (800) 352-0301)
	Kingsport, TN 37662	TWX: (810) 574-5174
		Telex: 553450
		Cable: EASTCHEM, Kingsport, Tennessee
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	Seattle, WA 98109, 318 Queen Anne Avenue, North	(206) 284-1620
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CANADA and LATIN AMERICA (except BRAZIL)	**EASTMAN CHEMICAL INTERNATIONAL LTD.***	
	Kingsport, TN 37662, P. O. Box 431	(615) 229-2000
	(Toronto) Don Mills, Ontario, Canada M3C 1J5, 40 Wynford Drive . .	(416) 449-0160
	Montreal, Quebec, Canada H4B 2Y4, EASTMANCHEM, INC. 2525 Cavendish Blvd., Suite 115	(514) 483-1180
	Puerto Rico: Dial direct (toll free)	137 (800) 251-0351
BRAZIL	**EASTMAN CHEMICAL BRASILEIRA LTDA.***	
	Sao Paulo, Brazil, Rua George Eastman, Caixa Postal 225	542-8463
EUROPE, AFRICA, the MIDDLE EAST, and the NEAR EAST	**EASTMAN CHEMICAL INTERNATIONAL A.G.***	
	CH-6301 Zug, Switzerland, Baarerstrasse 8	(042) 232525
	75012 Paris, France, 10 Rue Villiot	(1) 347-85-55 or (1) 347-87-45
	20124 Milan, Italy, Via Rosellini 12	(02) 688-4563
	Hemel Hempstead, Herts, HP1 1JU England, P. O. Box 66, Kodak House, Station Road	(0442) 41171
ASIA, AUSTRALIA, and NEW ZEALAND	**EASTMAN CHEMICAL INTERNATIONAL COMPANY***	
	Kingsport, TN 37662, P. O. Box 431	(615) 229-2000
	Hong Kong, 1506 Guardian House, P. O. Box 47025, Morrison Hill Post Office	5-748351
	EASTMAN CHEMICAL INTERNATIONAL LTD.*	
	(Sydney) Chatswood, New South Wales, Australia 2067, 3-9 Spring Street, Suite No. 3, P. O. Box 426	411-3399
	Singapore 0409, #09-23 World Trade Centre	278-8011 or 278-8012

*DESIGNATES MARKETING AFFILIATES OF EASTMAN KODAK COMPANY

Publication No. M-198C
May 1983

ECP 4318 (5-83)

Printed in U.S.A.

MATERIAL SAFETY DATA SHEET

EASTMAN CHEMICAL PRODUCTS, INC.
Kingsport, Tennessee 37662

For Health Hazard Information, call: (615) 229-6094, 8am-5pm (Eastern), Mon.-Fri.
(615) 229-4374 at all other times

For other information, call: (615) 229-3339

Date of Preparation: 11-22-82

Approved by U. S. Department of Labor: Essentially Similar to OSHA-20

SECTION I. IDENTIFICATION

- Product Name: EKTASOLVE® EP Solvent

- Synonyms: Ethylene glycol monopropyl ether; 2-Propoxyethanol
- Formula: $C_3H_7OC_2H_4OH$
- Molecular Weight: 104.15

SECTION II. PRODUCT AND COMPONENT HAZARD DATA

A. COMPONENT:	Approx. Percent	TLV**	CAS Reg. No.
2-Propoxyethanol	100	None**	2807-30-9

**See Section VI-A for additional information on exposure limits.

B. PRECAUTIONARY LABEL STATEMENTS:

WARNING! MAY BE HARMFUL IF INHALED OR ABSORBED THROUGH THE SKIN
MAY CAUSE EYE IRRITATION
COMBUSTIBLE

Avoid breathing vapor.
Avoid contact with eyes, skin, and clothing.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.
Keep away from heat and open flame.

FIRST AID: If inhaled, remove to fresh air. Treat symptomatically. Call a physician. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before reuse.

IN CASE OF FIRE: Use water spray, dry chemical, "alcohol" foam or CO_2. Use water spray to keep fire-exposed containers cool.

IN CASE OF SPILL: Eliminate all ignition sources. Flush spill area with water spray. Prevent runoff from entering drains, sewers, and streams.

Product residue may remain on or in 'empty' package. All precautions for handling the product must be used in handling the empty package and residue. Clean before reusing or altering package.

SECTION III. PHYSICAL DATA

- Boiling Point: 149.5°C (301°F)
- Melting Point: below -90°C (below -130°F)
- Specific Gravity (H_2O = 1): 0.908 at 73°F
- Vapor Pressure: 1.3 mm Hg at 25°C
- Percent Volatile by Volume: approx. 100
- Vapor Density (Air = 1): 3.6
- Evaporation Rate (n-butyl acetate = 1): 0.22
- Solubility in Water: Complete
- Appearance and Odor: Clear, colorless liquid; mild odor.

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

- Flash Point: 49°C (120°F)
  Method Used: SCC
- Autoignition Temperature: 235°C (455°F); ASTM D2155
- Flammable Limits: LEL 1.26% at 69°C UEL 15.8% at 127°C
- Extinguishing Agent: Water Spray, Dry Chemical, CO_2, and "Alcohol" Foam
- Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Use water spray to keep fire-exposed containers cool.
- Unusual Fire and Explosion Hazards: None known to Eastman.

SECTION V. REACTIVITY DATA

- Stability: Stable.
- Incompatibility: Oxidizing materials can cause a reaction.
- Hazardous Decomposition Products: As with any other organic material, combustion will produce carbon dioxide and probably carbon monoxide.
- Hazardous Polymerization: Will not occur.

SECTION VI. TOXICITY AND HEALTH

A. EXPOSURE LIMITS

- Eastman has established a company industrial hygiene guideline of 25 ppm-TWA, "Skin Notation".
- OSHA Permissible Exposure Limit (PEL): Not established.
- Threshold Limit Value (TLV): Not established.
- An industrial hygiene analytical method is available to health and safety professionals upon request.

B. EXPOSURE EFFECTS

Studies in experimental animals have produced damage to the red blood cell by inhalation, skin absorption, and ingestion.

Inhalation Study: Male rats were exposed to an airborne concentration of 100 ppm, 6 hours/day, 5 days/week, for 12 exposures. No significant abnormalities were seen in weight gain, clinical signs, hematology studies, clinical chemistry studies, terminal body weight, organ weights, gross pathology or histopathology. (2)

Feeding Study: Male rats were given 1560, 780, 390, or 195 mg/kg/day by gavage, 5 days a week, for 6 weeks. Toxic effects were confined primarily to the red blood cell. The hemoglobin concentration and red blood cell count were reduced at all doses while the hematocrit was normal. The MCV and MCH were increased and the MCHC decreased at the two higher doses. Bloody urine was seen throughout the study at the two higher doses, during the first day at 390 mg/kg/day, and on one occasion in each of 2 (of 10) animals at the lowest dose. Markedly enlarged dark spleens were present at all but the lowest dose; histologically, there was splenic congestion at all doses and extramedulary hematopoesis in some animals at the two intermediate doses. Clinical chemistry studies were normal. Additional findings include 20% mortality, reduced feed intake and terminal body weight, and clinical signs of ill health at the highest dose; 10% mortality at 780 mg/kg/day; hyperkeratosis of the stomach at the two higher doses; and a slight but nonsignificant decrease in weight gain at all dose levels. There was no evidence of toxicity to the bone marrow, white blood cell, thymus or testicle. (2)

Additional studies: A teratology study in rats via inhalation and additional subchronic inhalation studies in rats are under way at the Health, Safety, and Human Factors Laboratory, Eastman Kodak Company, Rochester, New York. This MSDS will be revised to include these data as soon as they are available.

SECTION VII. PERSONAL PROTECTION AND CONTROLS

A. RESPIRATORY PROTECTION

An appropriate NIOSH-approved respirator for organic vapor should be worn if needed.

B. VENTILATION

General: Recommend at least ten air changes per hour for good general room ventilation.

Local Exhaust: If needed to control vapor. See Section VI-A for detailed information on exposure limits.

C. SKIN AND EYE PROTECTION

Safety glasses should be worn in any type of industrial operation. Protective gloves should be worn. An impermeable apron or smock should be worn to minimize skin contact.

D. OTHER CONTROL MEASURES

A safety shower, an eye bath, and washing facilities should be available. Wash thoroughly after handling. Keep container closed.

Inhalation: May be harmful if inhaled.

Eyes: May cause irritation.

Skin: May be harmful if absorbed through the skin.

Ingestion: May be harmful if swallowed.

Summary: Predicted effects listed above are based on experimental animal data. No adverse effects in humans are known by Eastman to have been reported from exposure to this material.

C. FIRST AID

Inhalation: Remove from exposure, treat symptomatically, and get medical attention.

Eyes: Immediately flush with plenty of water for at least 15 minutes and get medical attention.

Skin: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash contaminated clothing before reuse.

Ingestion: If conscious, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Get medical attention as soon as possible. Never give anything by mouth to an unconscious person.

D. ANIMAL TOXICITY DATA

Test	Species	Result	Toxicity Classification (1)
Acute oral LD_{50}	Rat	3089 mg/kg (2)	Slightly toxic
Acute oral LD_{50}	Mouse	1774 mg/kg (2)	Slightly toxic
Dermal LD_{50}	Rabbit	1337 mg/kg (2)	
Inhalation LC_{50}	Rat	>2132 ppm/6 h (2)	
Skin irritation	Rabbit	Slight (2)	
Skin irritation	Guinea pig	Slight (2)	
Repeated skin application	Guinea pig	Slight exacerbation (2)	
Skin sensitization	Guinea pig	Slight (2)	
Eye irritation	Rabbit	Moderate to severe (2)	

Single Dose Studies: Red discolored urine was seen in oral LD_{50} studies at the lowest dose tested, 200 mg/kg, in dermal LD_{50} studies at doses as low as 1100 mg/kg, and in inhalation LC_{50} studies at doses as low as 1100 ppm. During the inhalation LC_{50} study, hemoglobin and hematocrit were reduced at the lowest exposure level, 273 ppm. (2) In rats, a 4-hour inhalation exposure increased the osmotic fragility of the red blood cell at 62 ppm but not at 32 ppm. (3)

SECTION XI. TRANSPORTATION

DOT Hazard Classification: Combustible Liquid
Flashpoint: See Section IV.

SECTION XII. REFERENCES

1. H. C. Hodge and J. H. Sterner. Tabulation of toxicity classes. American Industrial Hygiene Association Quarterly 1949; 10:93-96.

2. Unpublished data, Health, Safety, and Human Factors Laboratory, Eastman Kodak Co., Rochester, New York.

3. C. P. Carpenter, U. C. Pozzani, C. S. Weil, J. H. Nair, G. A. Keck, and H. F. Smyth, Jr. The toxicity of Butyl Cellosolve solvent. A.M.A. Archives of Industrial Health 1956;14:114-131.

4. A. L. Bridie, C.J.M. Wolff, and M. Winter. The acute toxicity of some petrochemicals to goldfish. Water Research 1979;13:623-626.

Check Sheet

Company Name: Spiralkote, Inc.
Permit Number: General
PSD Number: _____
Permit Engineer: _____

Application:

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

Cross References:
- ☑ AC 48-157290
- ☐ -192219
- ☐ AO 48-146002

Intent:

- ☐ 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

Final

Determination:

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

Post Permit Correspondence:

- ☐ Extensions/Amendments/Modifications
- ☐ Other

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL PROTECTION

In the matter of:	Permit No.	AC 48-157290
		AC 48-192219
fp Spiralkote, Inc.		AO 48-146002
Petitioner.	Order No.	ASP 93-G-01

12/28/93

ORDER ON REQUEST
FOR
ALTERNATE PROCEDURES
AND
REDUCTION IN TEST DURATION

Pursuant to Rule 17-297.620, Florida Administrative Code (F.A.C.), fp Spiralkote, Incorporated, petitioned for approval to use EPA Procedure G.1 in lieu of EPA Procedure G.2 for the measurement of volatile organic compound concentrations in the captured emissions from Petitioner's 36" WH1 746 CC Olympia Flexorex press, permit number AC 48-192219, 52" WH2 746 ST Olympia Flexorex press, permit number AC 48-157290 and Kidder Central Impression press, permit number AO 48-146002, located in Orange County. Petitioner also requested approval to reduce the duration of the required capture efficiency tests for their Kidder Central Impression press, permit number AO 48-146002.

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 July 28, 1993, Petitioner specifically requested approval to substitute EPA Procedure G.1 for EPA Procedure G.2 (dilution technique) with EPA Protocol 1c, Option A (a gas/gas method) to measure the capture efficiency of Petitioner's volatile organic compound collection system. [Exhibit 1]

2. As justification for the request, Petitioner stated, "The current rental fee for a dilution probe is $1,350.00 for a 10 day minimum. A minimum of 2 full cylinders of diluent gas per day per probe is also required. I need three such probes to perform G-2 testing at Spiralkote. With shipping, I estimate our test cost will be raised about $7,500.00 plus the additional field labor necessary for use. This is a completely unnecessary expense for my client since there is no technical gain and potentially a loss for the emission data obtained." [Exhibit 2]

3. Rule 17-297.450(2)(c), F.A.C., requires Petitioner to use Procedures G.2 and F.2 when measuring capture efficiency pursuant to Protocol 1c,Option A, which is a gas/gas method.

4. The U.S. EPA's April 16, 1990 memo, "Guidelines for Developing a State Protocol for the Measurement of Capture Efficiency" has been adopted by reference in Rule 17-297.450, F.A.C. The referenced memorandum states, "It (Procedure G.1) is intended to be used as a segment in the development of liquid/gas or gas/gas protocols for determining VOC capture efficiency for surface coating and printing operations." [Exhibit 3]

5. On September 16, 1993, the Region IV Office of the U.S. EPA stated, "Although Procedure G.2 makes it possible to use one analyzer for testing both captured and fugitive gas streams, equally accurate results can be obtained using Procedure G.1 if sampling is conducted with a multiple range monitor or with two analyzers operating on different ranges. Therefore, Procedure G.1 would be an acceptable alternative to Procedure G.2 for volatile organic compound capture efficiency testing at Spiralkote." [Exhibit 4]

6. On July 28, 1993, Petitioner specifically requested approval to reduce the duration for each run of the required capture efficiency testing for Petitioner's Kidder Central Impression press system which is equipped with a volatile organic compound incinerator. [Exhibit 1]

7. As justification for the request for the reduced test duration, Petitioner states, "Our request for three hour runs is necessary because it is necessary to run a non product type of roll for testing purposes to ensure maximum VOC usage. The normal products that use maximum VOC are short runs of low frequency and use too many colors. It is much easier to document short term VOC usage rates by making a simulated product. Since a simulated product cannot be sold, greater than three hour run times is economically excessive." [Exhibit 5]

8. On January 3, 1992, the Region IV of the U.S. EPA stated, "During the VOC Policy and VOC Compliance Workgroup meetings which were held in December 3-5, in Durham, North Carolina, Headquarters staff announced to the workgroup members that the sampling requirements for the capture efficiency test procedure would be revised to require a minimum of three-hour runs. EPA's reconsideration of the length of the test procedure was due to EPA receiving negative industry comments on the Chicago federal implementation plan (FIP). As a result of the comments, additional in-plant testing was performed to determine the reliability of the shorter test run requirement." [Exhibit 6]

9. The proposed revision to the sampling requirements (Item 1.4) of EPA's capture efficiency test procedure states, "A capture efficiency test shall consist of at least three sampling runs. Each run shall cover at least one complete production cycle but shall be at least 3 hours long. The sampling time for each run need not

exceed 8 hours even if the production cycle has not been completed. Alternative sampling times may be used with the approval of the Administrator." [Exhibit 6]

CONCLUSIONS OF LAW

1. The Department has jurisdiction to consider Petitioner's request pursuant to Section 403.061, Florida Statutes, and Rule 17-297.620, Florida Administrative Code.

2. Pursuant to Rule 17-297.340(2), F.A.C., the Department may require the owner or operator to conduct compliance tests which identify the nature and quantity of emissions, if, after investigation, there is good reason to believe an applicable emission standard is being violated.

3. Petitioner has provided reasonable justification to use EPA Procedure G.1 for the measurement of the volatile organic compound concentrations in the captured emissions.

4. Petitioner has provided reasonable justification for the request to reduce the minimum duration of each capture efficiency test run to three hours.

ORDER

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

1. Petitioner's request to use EPA Procedure G.1 in lieu EPA Procedure G.2 is granted;

2. If Petitioner elects to use gas/gas method using the building or room in which the affected source is located as the enclosure, then, all fans and blowers in the building or room shall be operated as they would under normal production pursuant to rule 17-297.450(2)(c), F.A.C., and the building shall comply with the requirements of Procedure T;

3. The Department retains the right to require Petitioner to conduct Procedure G.2, if, after investigation, it is believed that the use of Procedure G.2 is necessary to more accurately measure the volatile organic compound content of the captured emissions and to assess the compliance status of the affected source;

4. Pursuant to Rule 17-297.310(1), F.A.C., Petitioner shall complete the three required compliance test runs within one consecutive five day period;

5. Petitioner's request for a reduction in the duration of each capture efficiency test run from eight hours to three hours is granted;

6. The Department retains the right to require a sampling time

of at least eight hours for each capture efficiency test run, if after investigation, it is not possible to assess the compliance status of the affected source; and,

7. Pursuant to Rule 17-297.570(2), F.A.C., Petitioner shall submit the compliance test report to the Air Program Supervisor, Orange County Environmental Protection Department and to the District Manager for the Department's Central District Office within 45 days of completion of the test.

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. 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 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.

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 application 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. F.A.C. 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.

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.

DONE AND ORDERED this 28 day of December, 1993 in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

for HOWARD L. RHODES
Director
Division of Air Resources Management
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

(904) 488-0114

CERTIFICATE OF SERVICE

I CERTIFY that a true and correct copy of the foregoing has been mailed to Michael P. Coleman, Corporate Manager of Regulatory Affairs, Fleming Packaging Corporation, 1028 Southwest Adams Street, Peoria, Illinois 61602, and Carey Mann, Vice President - Treasurer, Spirlakote, Inc., 1200 Central Florida Parkway, Orlando, Florida 32851-9295, on this 29th day of December 1993.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

W.H. Congdon

William H. Congdon
Deputy General Counsel

2600 Blair Stone Road
Tallahassee, FL 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

July 20, 1993

Mr. Dennis Nester
Orange County Pollution
Control Department
2002 East Michigan Street
Orlando, Florida 32806

RE: Annual Compliance Testing
at Spiralkote, Inc.

Dear Mr. Nester:

I have provided a protocol for performing annual compliance testing at the above referenced facility. The testing will be conducted for all three press systems in much the same way as the WH-1 and WH-2 press systems were tested in 1992. The capture efficiency testing will be modified as a 200 FPM minimum face velocity across all NDO's is not required.

I have forwarded a copy of this protocol to Mr. Mike Harley, as I understand that the use of Procedure G-1 will constitute an ASP request. We wish to perform this testing the week of August 23, 1993 so I hope this will expedite the procedure. The three hour test runs were allowed last year and the G-1 Procedure was recently approved by the EPA Region IV for a similar ASP request, so we hope the matter may be handled internally with the Florida Department of Environmental Protection.

Please contact me if you have any questions.

Respectfully,

AIR CONSULTING AND ENGINEERING, INC.

Stephen L. Neck

Stephen L. Neck, P.E.

SLN/cvt

Enclosures

cc: Mike Harley, FDEP/Tallahassee
Mike Coleman, Fleming Packaging Corporation

ACE File: 200 93 02

Exhibit 1

PROTOCOL
FOR PERFORMING

VOLATILE ORGANIC COMPOUND EMISSION TESTING

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
PROTOCOLS FOR
CAPTURE AND DESTRUCTION EFFICIENCIES

52" WH2 746 ST OLYMPIA FLEXOREX PRESS
FDEP PERMIT NO. AC 48-157290

AND

36" WH1 746 CC OLYMPIA FLEXOREX PRESS
FDEP PERMIT NO. AC 48-192219

AND

KIDDER CENTRAL IMPRESSION PRESS
FDEP PERMIT NO. AO48-146002

Prepared for:

SPIRALKOTE, INC.
1200 CENTRAL FLORIDA PARKWAY
ORLANDO, FLORIDA 32821

Prepared by:

AIR CONSULTING AND ENGINEERING, INC.
2106 N.W. 67TH PLACE, SUITE 4
GAINESVILLE, FLORIDA 32606
(904) 335-1889

1.0 INTRODUCTION

A protocol is presented for Volatile Organic Compound (VOC) emission testing as required by the Florida Department of Environmental Protection (FDEP) permits covering three Flexographic Press Systems at the Spiralkote, Inc., facility in Orlando, Florida.

The protocol employs the use of the gas/gas methodology of determining VOC capture efficiency using the building as a total enclosure for confinement of fugitive emissions. The capture efficiency procedures employ Environmental Protection Agency (EPA) Method 25A as an analytical tool.

Destruction efficiency for each incinerator will be determined using EPA Method 25 at each incinerator inlet and outlet.

2.0 PLAN OF STUDY

2.1 Use of the Building or Room as a Total Enclosure

WH Press Room - Two Olympia Flexorex Presses are located in one large room. The press layout is provided in Figure 1. Operation of one of four roof exhaust fans for fugitive emissions will be adequate for an exhaust air to supply air ratio of greater than 1.1. The exhaust fans not in use will be sealed with plastic. All Natural Draft Openings (NDO's) will be monitored with cellulose streamers to verify negative air flow. Procedure F.1 will be used to measure fugitive emissions.

Kidder C.I. Press - The C.I. Press is located in a large room adjacent to the WH Press Room. There are two exhaust fans in this area. Operation of one of these fans will provide a single fugitive emission source and ensure a greater than 1.1 exhaust to supply air room ratio. The fan not used will be sealed with plastic. A schematic of the press layout is not available at present.

2.2 Fugitive VOC Emission Measurement

Three 3-hour capture efficiency test runs will be conducted. The fugitive emissions from the roof fans will be monitored during each test run using procedure F.2.

2.3 Captured VOC Emissions

Testing for capture efficiency of the WH-1 and WH-2 systems will be conducted separately and at a different times. The WH-1 system has three catalytic oxidizer control systems. The inlet to each incinerator will be monitored using Procedure G.1. Identical captured emission testing will be conducted on WH-2 and the C.I. presses (separately) except there are two incinerators. Three 3-hour test runs will be conducted simultaneous to the F.2 testing for each press.

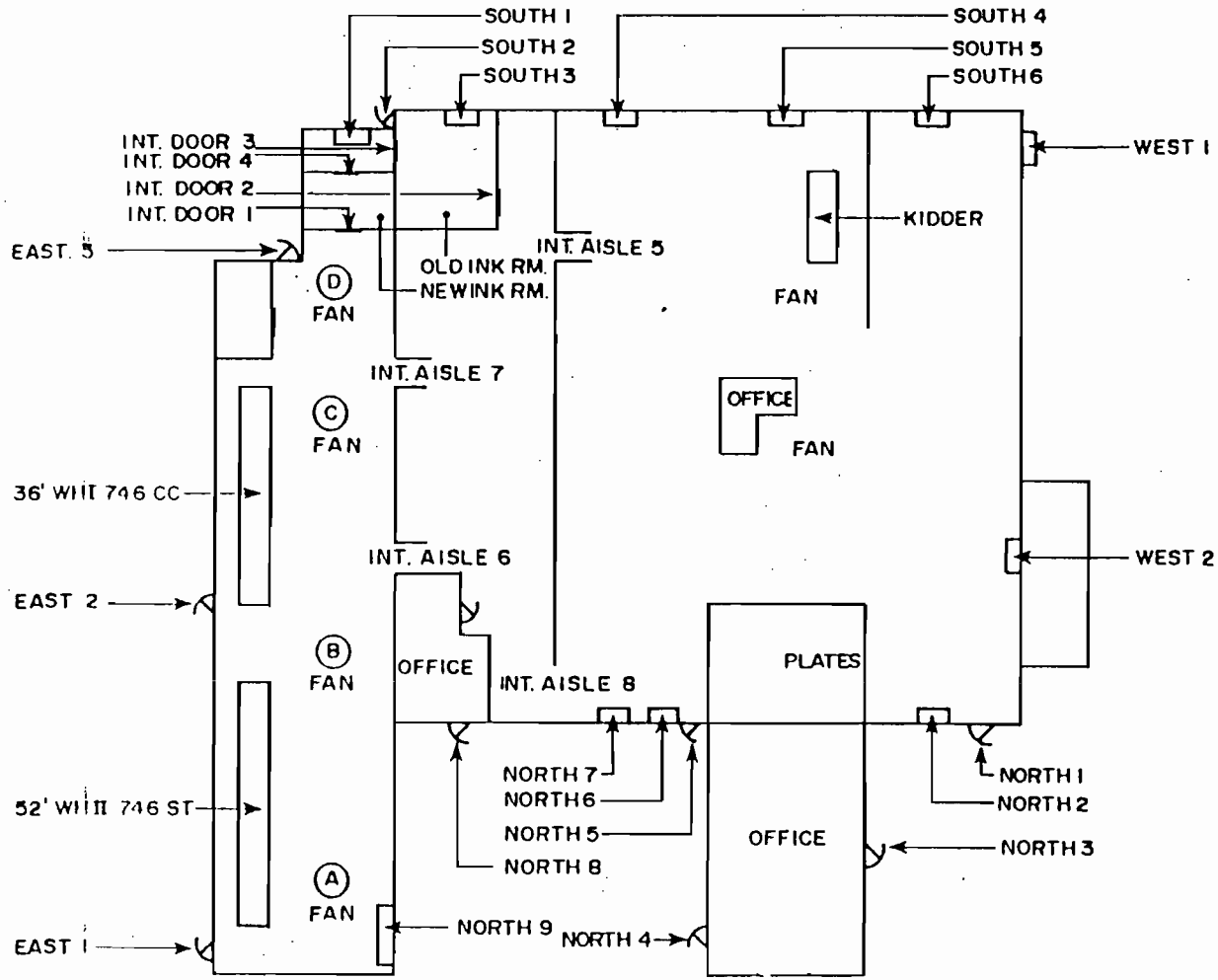

FIGURE 1.
NATURAL DRAFT OPENINGS AND
WH PRESS RUN EXHAUST POINTS
SPIRALKOTE, INC.
ORLANDO, FLORIDA

AIR CONSULTING
and
ENGINEERING

2.4 Incinerator Destruction Efficiency

Destruction efficiency of each incinerator will be demonstrated with three 1-hour EPA Method 25 simultaneous inlet and outlet test runs. These tests will be conducted during the capture efficiency testing of each press.

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AIR CONSULTING
& ENGINEERING, INC.

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

August 10, 1993

Mr. Dennis Nester
Orange County Pollution
Control Department
2002 East Michigan Street
Orlando, Florida 32806

RE: Spiralkote Testing as Outlined in
our July 20, 1993 Protocol Submittal

Dear Mr. Nester:

We wish to change our test schedule for this facility from the week of August 23 to September 13, 1993. We are doing this in hopes that this will allow time for issuance of a construction permit for the Kidder Central Impression Press so that the tests can be conducted at the desired production rate and incinerator control configuration.

Please also note that an ASP request has been made that asks for three-hour test runs for capture efficiency in lieu of eight hours and for use of Procedure G-1 for captured emissions in lieu of Procedure G-2 (dilution technique). The three hour test runs were allowed for two of the presses (WH1 and WH2) in a previous ASP request, I assume that we can proceed with three hour runs for these sources without a need for a new ASP. We will still need the ASP for the latter press however (Kidder C!).

All press lines need an ASP for use of Procedure G-1. Although Procedure G-1 was promulgated in 17-197.440(7) it is not specified for use in any of the protocols listed in 17-297.450. This was due to an erroneous conclusion being circulated by the EPA at the time of promulgation that has since been superseded. The current rental fee for a dilution probe is $1,350.00 for a 10 day minimum. A minimum of 2 full cylinders of dilutent gas per day per probe is also required. I need three such probes to perform G-2 testing at Spiralkote. With shipping, I estimate our test cost will be raised about $7,500.00 plus the additional field labor necessary for use. This is a completely unnecessary expense for my client since there is no technical gain and potentially a loss for the emission data obtained.

Exhibit 2

Please do what you can to expedite our ASP request so that we may avoid these additional test costs. Also please advise if it is possible to amend the present permits to specify G-1 in the test methodology for these sources, thus avoiding the ASP need.

Respectfully,

AIR CONSULTING AND ENGINEERING, INC.

Stephen L. Neck, P.E.

SLN/cvt

cc: Mike Harley, FDEP/Tallahassee ✓
Alan Zahm, FDEP/Orlando
Mike Coleman, Fleming Packaging
Ed Ward, Fleming Packaging
Jerome Guidry, Perigee Technical Services

ACE File: 200 93 02

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.

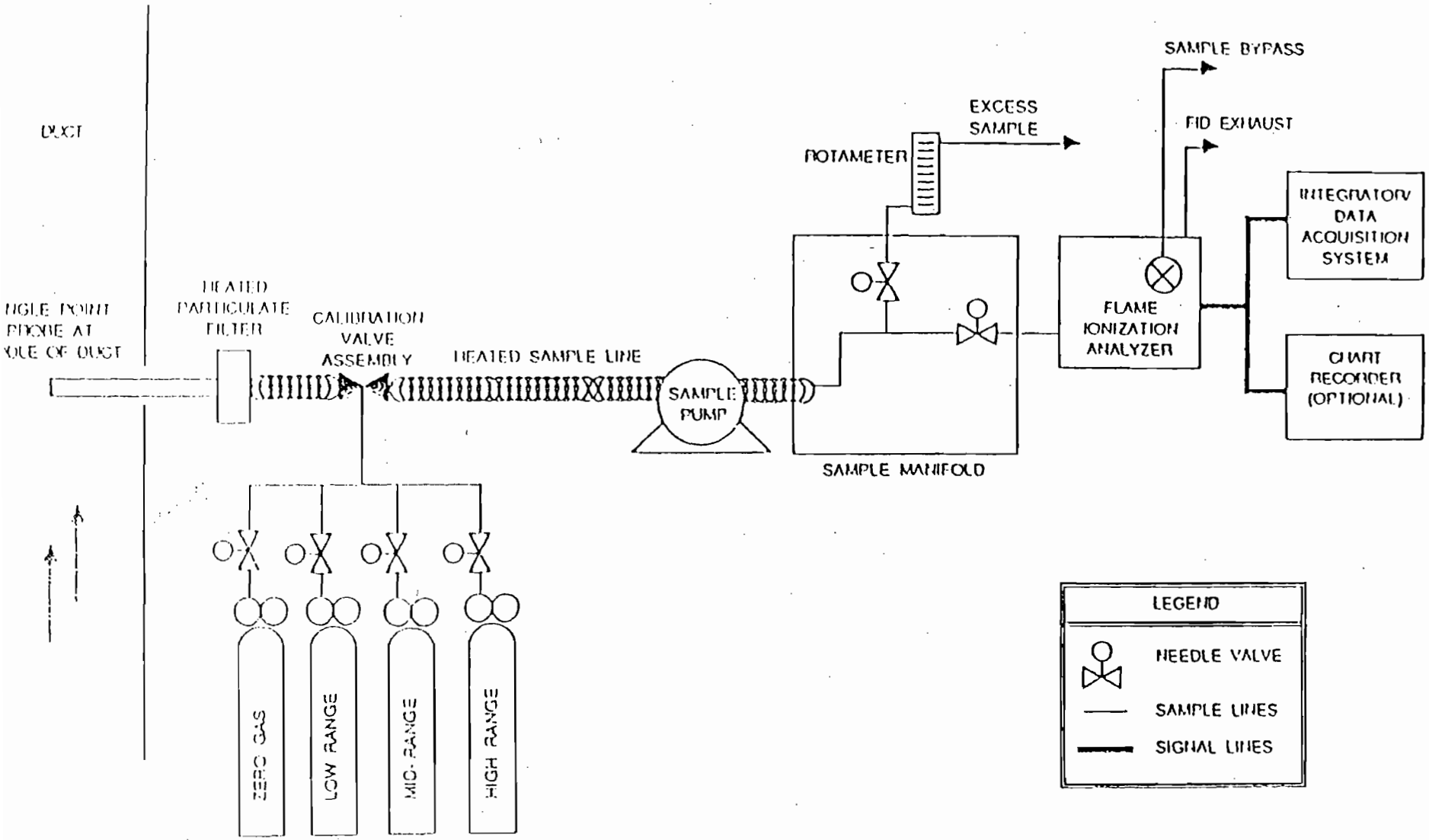


Figure 1. Gas VOC concentration measurement system.

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 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 5.3. 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.

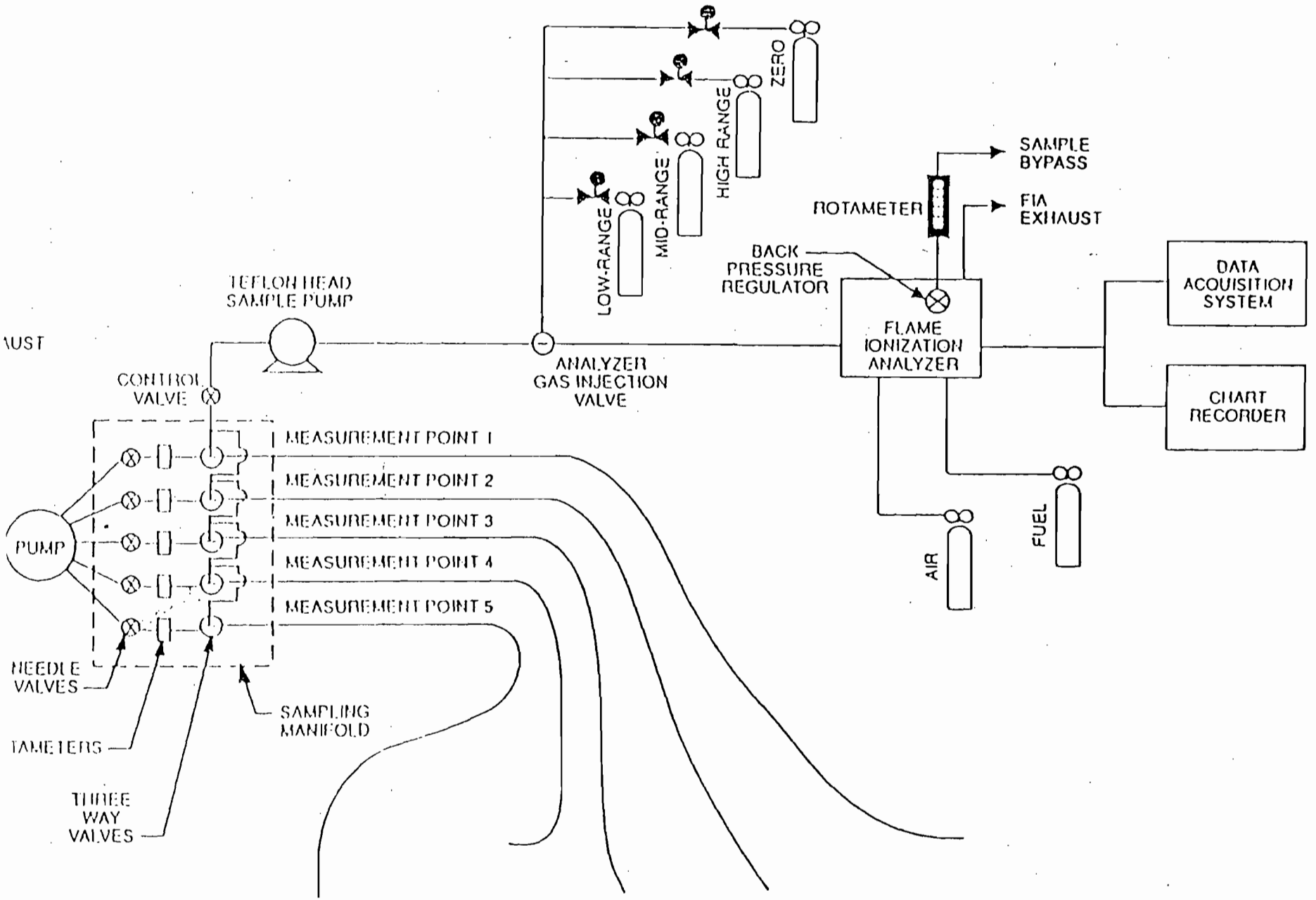


Figure 2. Background ... ompl system

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_h = 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.

$$C_{Gj} = (C_j - C_{DO}) \frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 2}$$

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

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

SEP 13 1993

DEPARTMENT OF
ENVIRONMENTAL PROTECTION

SEP 16 1993

OFFICE OF THE SECRETARY

4APT-AEB

Mr. Michael D. Harley, P.E., DEE
Administrator
Emission Monitoring Section
Air Resources Management Division
Florida Department of Environmental
Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Alternative Sampling Procedure Proposed for Spiralkote, Inc., Orlando, Florida

Dear Mr. Harley:

This letter is in response to your August 20, 1993, request for guidance regarding an alternative sampling procedure (ASP) proposed by the referenced company. The proposed ASP involves using Procedure G.1 instead of Procedure G.2 from Rule 17-297-.450(2)(c) to perform volatile organic compound (VOC) capture efficiency testing on three presses at the Spiralkote facility. After reviewing the request, we have determined that the ASP proposed by the company is acceptable.

Procedures G.1 and G.2 both involve using total hydrocarbon analyzers to measure VOC concentrations during capture efficiency testing. The major difference between the two procedures is that Procedure G.2 involves the use of a dilution system to reduce the concentration of samples before they reach the analyzer. The primary reason that Procedure G.2 was developed was so that a single analyzer operating on a single analyzer range could be used for measuring VOC concentrations in both captured and fugitive gas streams when capture efficiency testing is conducted using a total temporary enclosure or building enclosure.

Although Procedure G.2 makes it possible to use one analyzer for testing both captured and fugitive gas streams, equally accurate results can be obtained using Procedure G.1 if sampling is conducted with a multiple range monitor or with two analyzers operating on different ranges. Therefore, Procedure G.1 would be an acceptable alternative to Procedure G.2 for volatile organic compound capture efficiency testing at Spiralkote.

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

cc: Ramesh Menon, FL DER

Exhibit 4

ACE
AIR CONSULTING
& ENGINEERING, INC.

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

September 1, 1993

Mr. Michael D. Harley, PE, DEE
Administrator
Emission Monitoring Section
Florida Department of
Environmental Protection
Twin Towers Office Building

RE: Spiralkote, Inc.-Kidder CI ASP Request
and your Additional Information Request
of 8/20/93

Dear Mr. Harley:

I believe your office has received the authorization from Spiralkote for me to make the ASP request on their behalf. Please also note that Procedure F-2 will be used for fugitive emissions testing. I have provided a schematic of the incinerator and roof exhaust layout of the Kidder CI press. The incinerator I have designated as Catalytic Oxidizer 5 (CO5) is used to control emissions from the Between Color Decks (BCD) while CO6 is used to control coater deck emissions.

Our request for three hour test runs is necessary because it is necessary to run a "non product" type of roll for testing purposes to ensure maximum VOC usage. The normal products that use maximum VOC are short runs of low frequency and use too many colors. It is much easier to document short term VOC usage rates by making a simulated product. Since the simulated product cannot be sold, greater that three hour run times is economically excessive.

Please contact Mr. Mike Coleman or me if you have further questions.

Respectfully,

AIR CONSULTING AND ENGINEERING, INC.

Stephen L. Neck

Stephen L. Neck, P.E.

SLN/cvt

Enclosures

cc: Alan Zahm, Florida Dept. of Environmental Protection
Dennis Nester, Orange County Pollution Control Dept.
Mike Coleman, Fleming Packaging Corporation

ACE File: 200 93 02

Exhibit 5

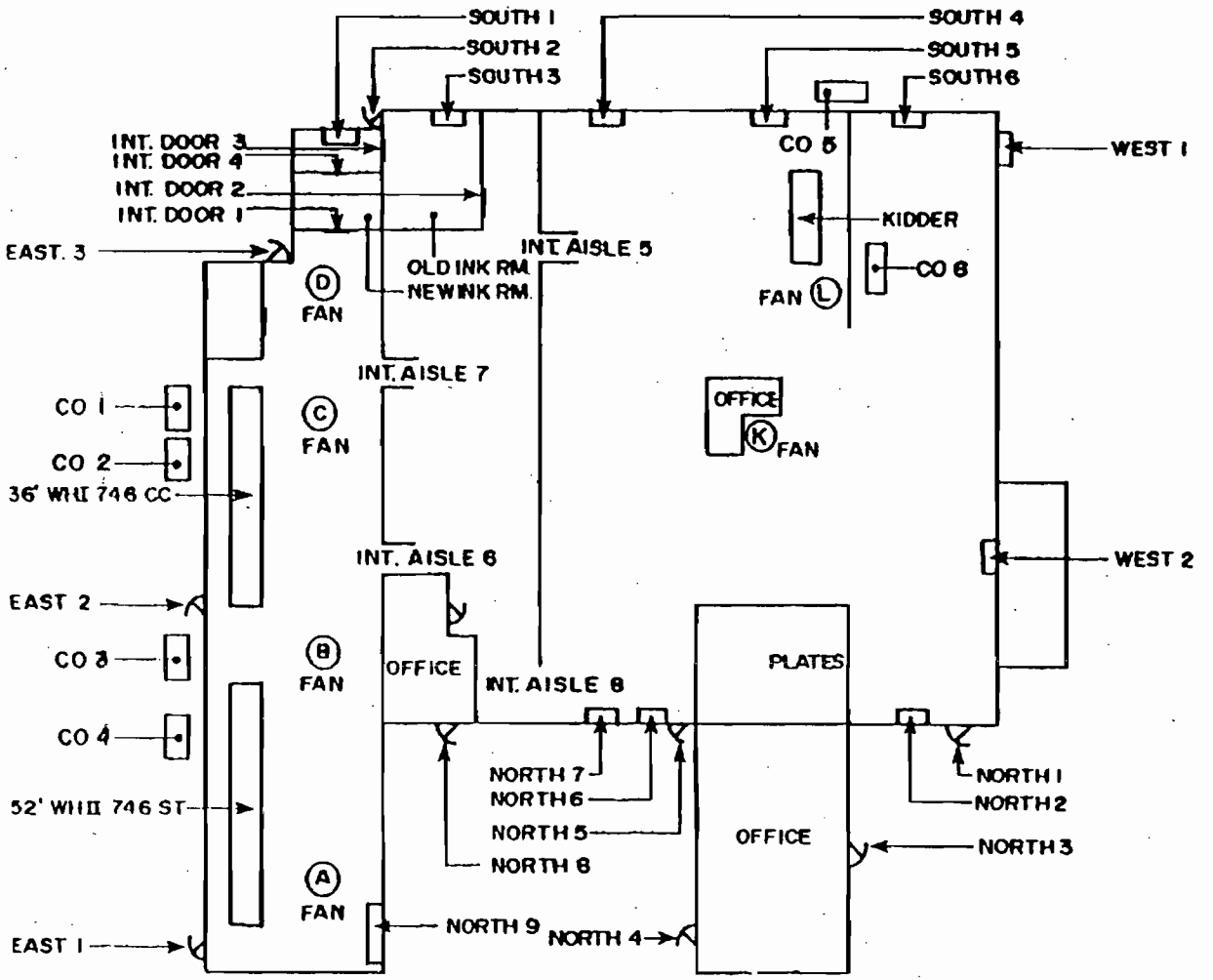


FIGURE 1.
NATURAL DRAFT OPENINGS AND
WII PRESS RUN EXHAUST POINTS
SPIRALKOTE, INC.
ORLANDO, FLORIDA

AIR CONSULTING
and
ENGINEERING

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

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

JAN 3 1992

4APT-APB

Mr. Steve Smallwood, P.E., Director
Division of Air Resources Management
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Smallwood:

This letter is written to notify you that EPA is revising capture efficiency test requirements. Historically, the capture efficiency test procedure has required a minimum of three eight hour sampling runs when determining capture efficiency. States in many of the Regions and the EPA Regional Offices have argued for shorter sampling runs due to cost and other hardships to the sources.

During the VOC Policy and VOC Compliance Workgroup meetings which were held December 3-5, in Durham, North Carolina, Headquarters staff announced to the workgroup members that the sampling requirements for the capture efficiency test procedure would be revised to require a minimum of three three-hour runs. EPA's reconsideration of the length of the test procedure was due to EPA receiving negative industry comments on the Chicago federal implementation plan (FIP). As a result of the comments, additional in-plant testing was performed to determine the reliability of the shorter test run requirement.

The specific language for this revision is enclosed (See Item 1.4). Also, EPA Headquarters is preparing a memorandum to explain its position on these changes which will be sent to each Region. This information will be forwarded to you as soon as it is available. We hope that this notice will allow State and local agencies to either modify rules currently in development, or to invoke the alternative sampling time clause in existing rules which will allow the enclosed language to be used in future source-test discussions.

Exhibit 6

We appreciate your understanding and patience with this issue. If you have any questions, please call Carol Kemker of my staff at (404) 347-2864.

Sincerely yours,

Jarrell Hurbh for

Douglas Neeley, Chief
Air Programs Branch
Air, Pesticides and Toxics
Management Division

Enclosure

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_G) 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. Each run shall cover at least one complete production cycle but shall be at least 3 hours long. The sampling time for each run need not exceed 8 hours even if the production cycle has not been completed. Alternative sampling times may be used with the approval of the Administrator.

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

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

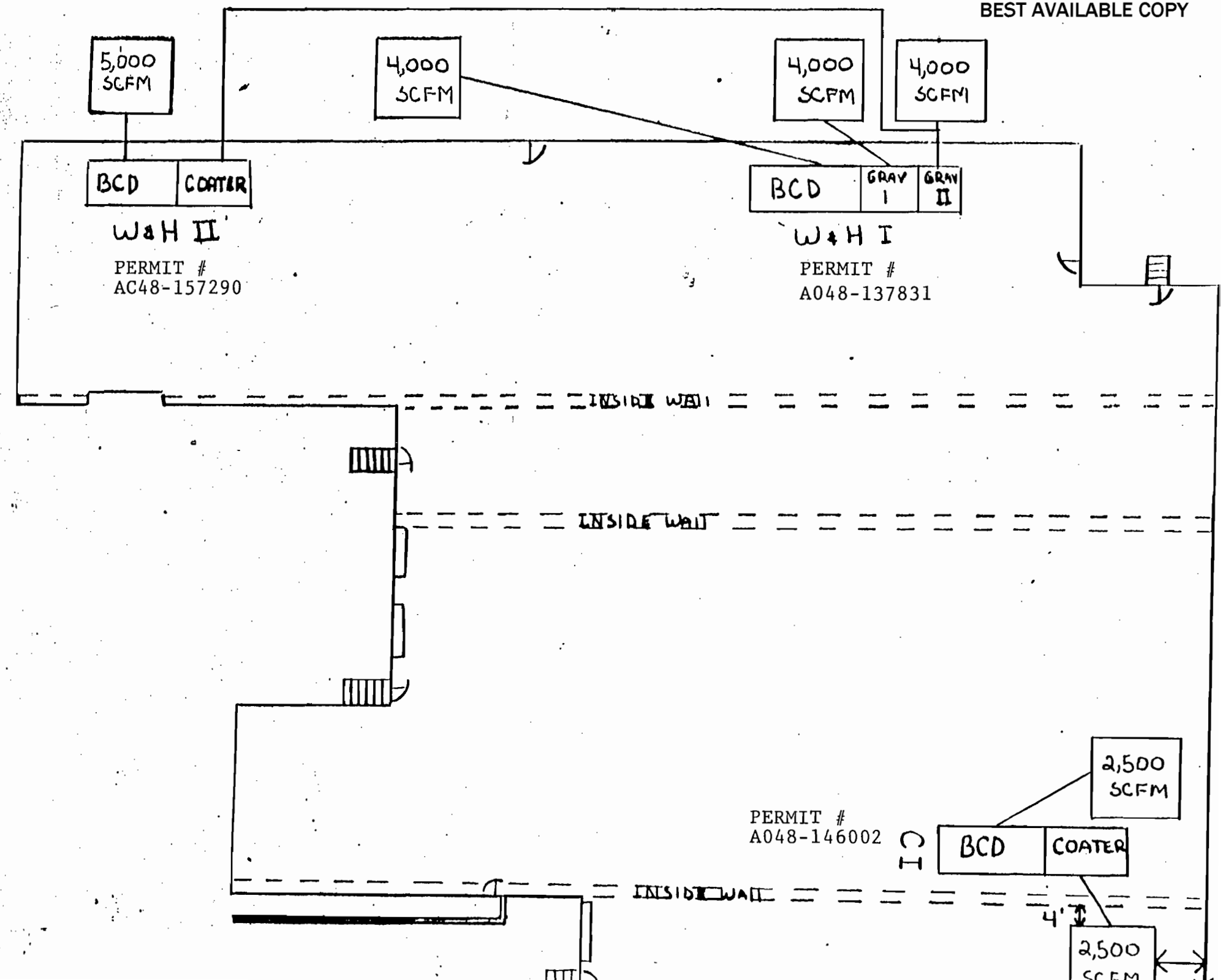
ED WARD
Vice President Production

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 12, 1990

RECEIVED

OCT 18 1990

DER BAQM

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

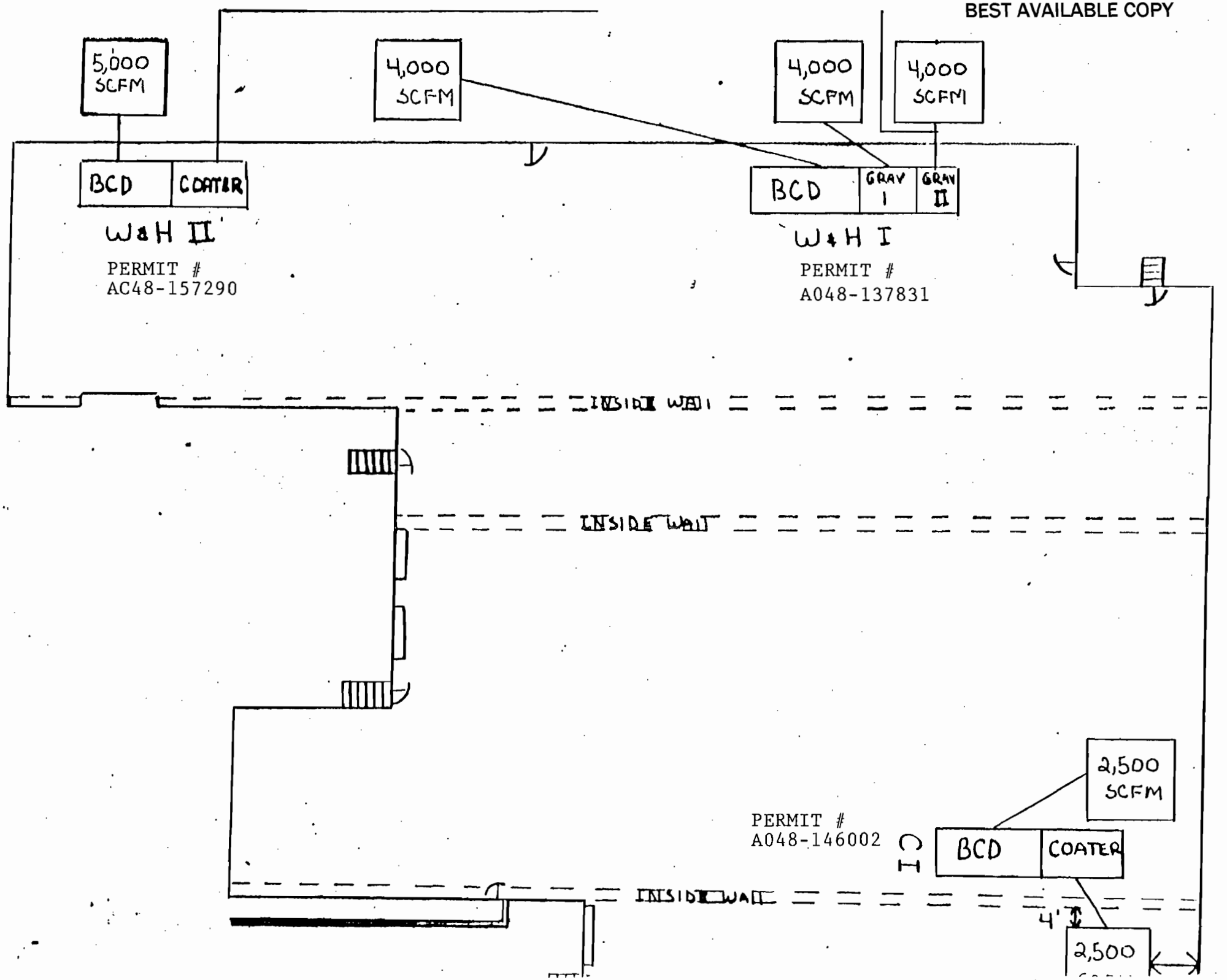
ED WARD
Vice President Production

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



To: Main File Copy

Florida Department of Environmental Regulation

Central District • 3319 Maguire Boulevard, Suite 232 • Orlando, Florida 32803-3767 • 407-894-7555

Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary | Alex Alexander, Deputy Assistant Secretary

December 13, 1988

COMPLETENESS SUMMARY AIR POLLUTION SOURCES

SOURCE NAME: Spiralkote - W & H Flexorex CC
746 Printing Press

DATE RECEIVED: 11/17/88

NAME: Jerome J. Guidry, P.E.
Post, Buckley, Schuh, & Jernigan, Inc.
ADDRESS: 889 North Orange Avenue
Orlando, Florida 32801-1088

DATE REVIEWED: 12/06/88

REVIEWED BY: J. Turner

(AC48-157290)

Your application for a permit to construct this referenced project has been received, and reviewed for completeness. The following checked item is needed to complete your application.

(X) Other: (Any section of the application which is incomplete or lacks sufficient information to be evaluated).

1. Section III: A and III: C - Clarify whether clean-up solvents are to be utilized and submit data if appropriate.

2. Section III: C - Submit emissions from the natural gas fired burners totaling 7.6 MMBTU/hr heat input.

3. Section V: 4 - Clarify the minimum catalytic bed temperature required to attain the guaranteed 95% minimum VOC destruction efficiency and whether this minimum temperature is to be maintained in normal operation since the stack temperature is 400°F, and whether the incinerator is equipped with a temperature sensor. Specify the procedures to be utilized to insure the catalyst has not been poisoned and is otherwise performing normally. Submit the drier operating temperatures.

4. Specify the points at which the uncaptured VOC emissions would be emitted to the ambient air including their heights, velocity and temperatures.

5. The application specifies a capture efficiency of 65% and a minimum destruction efficiency of 90% which yields an overall reduction of (0.65) (0.9) = 58.5%. Note that EPA guidance for similar sources specifies a minimum overall reduction efficiency of 60%. Please clarify whether Spiralkote is willing to propose to achieve the manufactures minimum destruction efficiency of 95%, or some other alternative, to increase the overall reduction efficiency to at least 60%.

6. Please provide more details on the compliance test methods and procedures to be utilized to demonstrate compliance including the locations of test ports and clarify whether the stack testing facilities will comply with the requirements of Rule 17-2.700(4) F.A.C.

Pursuant to Section 120.60(2) Florida Statutes, the department may deny an application if the applicant, after receiving timely notice fails to correct errors, omissions or supply additional information within a reasonable period of time.

If there are any questions, please call John Turner at 407/894-7555 or write to me at the above address.

Sincerely,

Charles M. Collins

Charles M. Collins, P.E.
Program Administrator
Air Quality

CMC/jtj

cc: Bruce Mitchell, Tallahassee

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

	Initial	Date
1. TO: (NAME, OFFICE, LOCATION) Bruce Mitchell Eng IV PGM BAQM CAPS Room 310 D		
2.		
3.		
4.		

Read 12-14-88 RAM

REMARKS: T T Tael.

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

RECEIVED
DEC 14 1988
DER - BAQM

FROM: C. M. Collins P.E.
Air Program Adm.
Central District

DATE 12-13-88

PHONE

Main File Co 67

For Routing To Other Than The Addressee

To: _____ Location: _____

To: _____ Location: _____

To: _____ Location: _____

From: _____ Date: _____

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

TO: John Turner
Central Florida District

THRU: Bill Thomas BT RAM

FROM: Bruce Mitchell

DATE: December 2, 1988

SUBJ: Comments on Spiralkote, Inc.'s Construction Permit Application Package for a W & H Flexorex CC 746 Printing Press

Based on a review of the above referenced application, I offer the following comments:

1. Are any solvents (VOC) used for clean-up? If so, projected or quantified usage (potential) is needed and was not provided.

2. Etter Engineering Co. Inc. recommends a minimum of 425°F for the catalytic bed. Will the proposed catalytic incinerator, where the exit temperature is to be 400°F, have a minimum of 425°F at the catalyst bed? If not, please explain why the company proposes a bed temperature less than what the vendor recommends.

3. An EPA graphic arts back-ground document (Dec. 87) for flexographs recommends a minimum overall efficiency of 60% (capture and destruction). Since the proposed overall efficiency is slightly less than 60% (65% capture and 90% destruction = 58.5% overall), it is recommended that the minimum capture efficiency be increased and/or the minimum destruction efficiency be increased (Note: Etter Eng. Co., Inc.'s manufacture specifications guarantees a minimum of 95% destruction efficiency).

BM/ks

enclosure

12-5-88

Bill,

Please review, edit, etc., or sign off. Thanks,

P.S. I called ST this AM.