Check Sheet

Company Name: MONSANTO CHEMICAL COMPANY
Permit Number: AC 17 - 136188
PSD Number:
Permit Engineer:

Application:

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

Cross References:

- ☐
- ☐
- ☐

Controlled pyrolysis cleaning furnace

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

PS Form 3811, July 1983 447-845

SENDER: Complete items 1, 2, 3 and 4.

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

1. ☒ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to: W.J. Board, S.E. Dir.
Governmental Affairs
Monsanto Chemical Company
Post Office Box 12830
Pensacola, FL 32575

4. Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number
P 274 007 678

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X /

6. Signature – Agent
X Bill Deer

7. Date of Delivery
OCT DER

8. Addressee's Address (ONLY if requested and fee paid)
OCT 1987
BAQM

DOMESTIC RETURN RECEIPT

P 274 007 678

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

Sent to W.J. Board Monsanto Chemical Co.	
Street and No. P.O. Box 12830	
P.O., State and ZIP Code Pensacola, FL 32575	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date Mailed: 10/02/87 Permit: AC 17-136188	

☆ U.S.G.P.O. 1985-480-794

PS Form 3800, June 1985

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT

Mr. W. J. Board
S.E. Director
Governmental Affairs
Monsanto Chemical Company
Post Office Box 12830
Pensacola, Florida 32575

October 2, 1987

Enclosed is construction permit No. AC 17-136188 to build a pyrolysis cleaning furnance at the Monsanto Chemical Company plant located in Escambia Company. This permit is issued pursuant to Section 403, Florida Statutes.

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

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management

Copy furnished to:

Bruce P. McLeod, P.E.
Jack Preece, NW Dist.

Final Determination

Monsanto Chemical Company
Pensacola, Florida
Escambia County

Controlled Pyrolysis Cleaning Furnace
Permit No. AC 17-136188

Florida Department of Environmental Regulation
Bureau of Air Quality Management
Central Air Permitting

September 29, 1987

Final Determination

The Technical Evaluation and Preliminary Determination for the proposed pyrolysis cleaning furnace at Monsanto Chemical Company's plant located in Escambia County, north of Pensacola, Florida, was distributed on July 30, 1987. Copies of the evaluation were available for public inspection at the Department's offices in Pensacola and Tallahassee. The Notice of Proposed Agency Action on the permit application was published in the Pensacola News Journal on August 29, 1987.

The applicant submitted comments in a letter dated July 31, 1987. Following is a summary of the applicant's comments and the Department's response.

Comment: Delete Specific Condition No. 6 which requires hourly recording of the oven's operation temperature because the unit is designed to operate at the specific temperature and this temperature cannot be adjusted in the field.

Response: The Department will retain Specific Conditons No. 6 but reduce the requirement to recording the temperature at start up only to provide assurance that the unit is being properly maintained and operated.

Comment: Rewrite Specific Condition No. 9 which listed the minimum information to be included in the annual operation report for the oven and change the frequency of the compliance tests to "as deemed appropriate by the District Office."

Response: Specific Condition No. 9 is revised to require, as a minimum, a recent visible emissions test report be included with the annual operation report.

The final action of the Department will be to issue the permit to construct as proposed in the Technical Evaluation and Preliminary Determination except for the changes discussed in this Final Determination.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

PERMITTEE:
Monsanto Company
P. O. Box 12830
Pensacola, Florida 32575

Permit Number: AC 17-136188
Expiration Date: January 1, 1989
County: Escambia
Latitude/Longitude: 30° 35' 59" N
87° 14' 50" W
Project: Vydyne Pyrolysis Oven

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

For the construction of a SCTR-15 Controlled Pyrolysis Cleaning Furnace (Vydyne Pyrolysis Oven) at the existing facility located in Escambia County, north of Pensacola, Florida, at the intersection of State Roads 292 and 297. The UTM coordinates of this site are: Zone 16, 479.96 km E and 3384.3 km N.

Construction shall be in accordance with the permit application and plan, documents, amendments, and drawings submitted, except as noted in the Preliminary Determination or the Specific Conditions.

Attachments are as follows:

1. Application to construct air pollution sources, DER Form 17-1.202(1), which was received on June 29, 1987, by FDER Bureau of Air Quality Management.

2. Monsanto Chemical Company's letter dated July 31, 1987.

PERMITTEE:
Monsanto Company

Permit Number: AC 17-136188
Expiration Date: January 1, 1989

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

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

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

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

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

GENERAL CONDITIONS:

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

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

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

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

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

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

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

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

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

GENERAL CONDITIONS:

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

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

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

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)
( ) Determination of Prevention of Significant Deterioration (PSD)
( ) Compliance with New Source Performance Standards

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

GENERAL CONDITIONS:

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

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

1. Only nylon resin is to be pyrolyzed in this furnace.

2. The annual amount of nylon resin pyrolyzed shall not exceed 10,000 pounds.

3. Continuous operation of the nylon resin pyrolysis furnace is approved (8,760 hours annually).

4. Visible emissions (VE) shall not exceed 5% opacity during any 6 minute period. Compliance with this standard shall be determined by EPA Method 9, Visual Determination of the Opacity of Emissions from Stationary Sources as described

PERMITTEE:
Monsanto Company

Permit Number: AC 17-136188
Expiration Date: January 1, 1989

SPECIFIC CONDITIONS:

in Appendix A of 40 CFR 60. If the visible emissions exceed 5% opacity, a Method 5 test, Determination of Particulate Emissions from Stationary Sources, may be required by the Department. The district office shall be notified 15 days prior to any compliance test.

5. Objectionable odors from the furnace shall not be allowed off plant property.

6. Afterburner temperature must exceed 1400° F when the furnace is in operation and the initial operation temperature shall be recorded each time the unit is placed in service.

7. Construction and operation shall reasonably conform to the plans submitted in the application. The permittee shall report any delay in construction of this project to the Department's Northwest District office.

8. The permittee shall submit a complete application for a permit to operate this furnace, which must include an emissions test report, to the DER Northwest District office at least 90 days prior to the expiration date of this construction permit. The permittee may continue to operate this source, if it is in compliance with all conditions of this construction permit, until its expiration date.

9. Upon obtaining a permit to operate, the permittee will be required to submit annual operation reports to the DER Northwest District office which shall include, as a minimum, a recent emissions test report for visible emissions as specified in Specific Condition No. 4.

Issued this 30 day of Sept, 1987

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

Dale Twachtmann, Secretary

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

FOR ROUTING TO OTHER THAN THE ADDRESSEE

To: _____ Loctn: _____
To: _____ Loctn: _____
To: _____ Loctn: _____
From: _____ Date: _____

TO: Dale Twachtmann

THRU: Howard Rhodes

FROM: Clair Fancy

DATE: September 29, 1987

SUBJ: Approval of Construction Permit No. AC 17-136188
Monsanto Company

Attached for your approval and signature is a construction permit to build a pyrolysis cleaning furnance at the Monsanto Chemical Company plant located in Escambia County. Comments were received during the public notice period from the applicant.

Day 90 after which this permit will be issued by default is November 23, 1987.

The Bureau recommends approval and signature.

CHF/MJ/s

attachment

RECEIVED
SEP 29 1987
Office of the Secretary

PM
UPS Overnight
#72299
9/10/87
Pensacola

File Copy

Monsanto

MONSANTO CHEMICAL COMPANY
P. O. Box 12830
Pensacola, Florida 32575
Phone: (904) 968-7000

VIA OVERNIGHT MAIL

September 10, 1987

[redacted] 9/10/87
Copied Jack Price
Willard Hanks

Mr. C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301-8141

Dear Mr. Fancy:

Attached is proof of publication of the public notice for construction permit AC17-136188, Controlled Pyrolysis Cleaning Furnace. This notice was republished as requested in your letter to me dated August 27, 1987.

Please issue this construction permit as soon as possible.

Sincerely,

BPM cleared 1/8

B. P. McLeod, Specialist
Environmental Control

Attachment

cc: J. G. Wiley, Monsanto, Pensacola

Copied: Willard Hanks
L. Huddleswart, NW Dist

DER
SEP 11 1987
BAQM

140A.BPM

file copy

DER

SEP 11 1987

BAQM

PENSACOLA News Journal

PUBLISHED DAILY
PENSACOLA, ESCAMBIA COUNTY, FLORIDA

State of Florida,
County of Escambia.

Before the undersigned authority personally appeared
J. Diane Deal

who on oath says that she is Legal Advertising Supervisor of the Pensacola News Journal, a daily newspaper published at Pensacola in Escambia County, Florida; with general circulation in Escambia, Santa Rosa, Okaloosa and Walton Counties that the attached copy of advertisement, being a NOTICE in the matter of

Ted Dotie

_____ in the _____ Court,

was published in said newspaper in the issues of

August 29, 1987

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

J. Diane Deal

Sworn to and subscribed before me this 4th day of Sept., A.D., 1987

Sally J. Fenton
NOTARY PUBLIC.

My Commission Expires Oct. 16, 1987

State of Florida
Department of
Environmental
Regulation
Notice of Intent

The Department gives notice of its intent to issue a permit to construct a Controlled Pyrolysis Cleaning Furnance with afterburner at the applicant's existing facility near the intersection of State Roads 292 and 297 in Escambia County, Florida. A determination of Best Available Control Technology was not required. The emissions from the furnace will not have a significant impact on the ambient air quality.

Persons whose substantial interests are affected by the Department's proposed permitting decisions may petition for an administrative determination (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Department's Office of General Counsel 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Failure to file a petition within this time period constitutes a waiver of any right such person has to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

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 proposed agency action. Therefore, persons who may not wish to file a petition may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Rule 28-5.207, Florida Administrative Code, at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009, Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.

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

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

Department of
Environmental Regulation
Northwest District
160 Governmental Center
Pensacola, Florida 3250[illegible]

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

LEGAL NO. 33342 1T
AUG. 29. 1987

Distribution:

*CONSIGNEE COPY

Monsanto

COMPANY

P. O. BOX 12830

PENSACOLA, FLORIDA 32575

SHIPMENT REQUEST & REPORT

SHIPMENT NO. SR72299

DATE 9/10/87 TO BLDG. 710

ATTN: C. R. Hicks

FROM T. L. Brooks

MATERIAL FROM:

FROM B. P. McLeod EXT. 8758 BLDG. 601 ROOM 201

SHIPMENT AUTHORIZED BY J. Wiley

PURCHASE ORDER REF: SR72299

DATE SHIPPED: 9/10/87

VIA: UPS OVERNITE

PRO. NO. _____ GROSS WT. L

AMT. P. P. D. XXX AMT. COL. _____

F. O. B. _____

NO. PKGS. ONE (1)

QTY. REQUESTED	QTY. SHIPPED	UNIT	DESCRIPTION
1	1	each	Letter to C. H. Fancy DER/Tal. Republished public notic, permit AC17-136188

DER

SEP 11 1987

BAQM

SHIP TO: Mr. C. H. Fancy PE
Deputy Chief - Bureau of Air Quality Mgt.
Dept. of Env. Regulation
2600 Blair Stone Road
Tallahassee, FL 32301-8141

EST. SHIPPING WT. L

SHIP VIA UPS Overnite COLLECT ☐ PREPAID XX

CHARGE TRANSPORTATION COST TO
ACCOUNT NUMBER 0271

INSURE FOR _____ DECLARED VALUE _____

RETURN TO VENDOR FOR ☐ CREDIT ☐ REPLACEMENT ☐ REPAIRS ☐ NOT TO BE REPLACED

SPECIAL INSTRUCTIONS:

Tracking No. 1035 9929 018

SHIPMENT COMPLETED BY _____ DATE _____

SHIPPING CLERK COMMENTS _____

CREDIT ACCT: _____ DEBIT ACCT: _____ VENDOR'S INVOICE _____

PTN 124.04.83-6
01 16 104

Monsanto

MONSANTO CHEMICAL COMPANY
P. O. Box 12830
Pensacola, Florida 32575

VIA OVERNIGHT MAIL

MR C H FANCY P E
DEPUTY CHIEF
BUREAU OF AIR QUALITY MANAGEMENT
DEPARTMENT OF ENVIRONMENTAL REGULATION
TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE FL 32301-8241

PS Form 3811, July 1983 447-845

SENDER: Complete items 1, 2, 3 and 4.

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

1. ☒ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:

B.P. McLeod, Specialist Env. Control
Monsanto Chemical Company
P.O. Box 12830
Pensacola, FL 32575

4. Type of Service:

☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number: P 408 532 122

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
X

7. Date of Delivery

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

DOMESTIC RETURN RECEIPT

PENSACOLA, FL DOMESTIC 32502

P 408 532 122

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to B.P. McLeod Monsanto Chemical Co.	
Street and No. P.O. Box 12830	
P.O., State and ZIP Code Pensacola, FL 32575	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date Mailed: 08/27/87 Permit: AC 17-136188	

PS Form 3800, Feb. 1982

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

August 27, 1987

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. B.P. McLeod, Specialist
Environmental Control
Monsanto Chemical Company
Post Office Box 12830
Pensacola, Florida 32575

Dear Mr. McLeod:

We have received your proof of publication for construction permit AC 17-136188, Controlled Pyrolysis Cleaning Furnance. After reviewing and comparing your Notice of Intent with the copy that was forwarded to your company for publication, it has been determined that the Notice will have to be republished as it does not appear as it was issued. The 90-day permit processing clock will not resume until we receive a copy of the readvertised Notice of Intent as was issued.

If you have any questions, please call Margaret Janes at (904) 488-1344 or write to me at the above address.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

/mvj

cc: B. Pittman, Esq., DER
E. Middleswart, NW Dist.

PM
24 Aug. 87
Gonzalez, FL

File Copy

Monsanto

MONSANTO CHEMICAL COMPANY
P. O. Box 12830
Pensacola, Florida 32575
Phone: (904) 968-7000

DER
AUG 25 1987
BAQM

August 24, 1987

Mr. C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301-8141

Dear Mr. Fancy:

Attached is proof of publication of the public notice for construction permit AC17-136188, Controlled Pyrolysis Cleaning Furnace.

Please issue this construction permit as soon as possible.

Sincerely,

B P McLeod

B. P. McLeod, Specialist
Environmental Control

Attachment

cc: J. G. Wiley, Monsanto, Pensacola
Copied: Willard Hanks
Jack Preece
8/25/87 mm

Called re: re publication
8.25.87 1:30 pm
8-27-87 - 10:15 am
8-27-87 returned my call at 11:50 am.

140A.BPM

DER

AUG 25 1987

BAQM

PENSACOLA News Journal

PUBLISHED DAILY
PENSACOLA, ESCAMBIA COUNTY, FLORIDA

State of Florida,
County of Escambia.

missing 1½ lines ⇒
Duplicated in complete

Before the undersigned authority personally appeared
J. Diane Deal

who on oath says that she is Legal Advertising Supervisor of the Pensacola News Journal, a daily newspaper published at Pensacola in Escambia County, Florida; with general circulation in Escambia, Santa Rosa, Okaloosa and Walton Counties that the attached copy of advertisement, being a NOTICE in the matter of

Intent

_____ in the _____ Court;

was published in said newspaper in the issues of

Aug. 6, 1987

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

J. Diane Deal

Sworn to and subscribed before me this 12th **day of** Aug. **,A.D., 19**87

Sally J. Pinkston
NOTARY PUBLIC.

My Commission Expires Oct. 16, 1987

State of Florida
Department of
Environmental
Regulation
Notice of Intent

The Department gives notice of its intent to issue a permit to construct a Controlled Pyrolysis Cleaning Furnance with afterburner at the applicant's existing facility near the intersection of State Roads 292 and 297 in Escambia County, Florida. A determination of Best Available Control Technology was not required. The emissions from the furnace will not have significant impact on the ambient air quality.

Persons whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative determination (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative General Counsel, 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Failure to file a petition within this time period of this notice. Failure to file a petition within this time period constitutes a waiver of any right such person has to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

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 proposed agency action. Therefore, persons who may not wish to file a petition may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to the proceeding. A petition for intervention must be filed pursuant to Rule 28-5.207, Florida Administrative Code, at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009, Apalchee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.

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

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

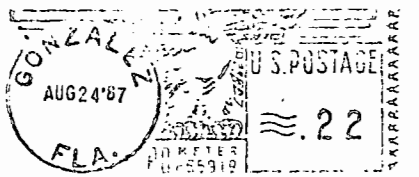
Department of
Environmental Regulation
Northwest District
160 Governmental Center
Pensacola, Florida 32501

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

LEGAL NO. 33231 1T
AUG. 6, 1987

Monsanto

MONSANTO CHEMICAL COMPANY
P. O. Box 12830
Pensacola, Florida 32575



MR C H FANCY P E
DEPUTY CHIEF
BUREAU OF AIR QUALITY MANAGEMENT
DEPARTMENT OF ENVIRONMENTAL REGULATION
TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE FL 32301-8241

PM
8/4/87
Pensacola

File copy

Monsanto

MONSANTO CHEMICAL COMPANY
P. O. Box 12830
Pensacola, Florida 32575
Phone: (904) 968-7000

July 31, 1987

Mr. Bill Thomas
Bureau of Air Quality Management
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Thomas:

Please consider the following comments relating to Permit AC17-136188.

1. Specific Condition 6 requires a minimum afterburner temperature of 1400°F. An afterburner temperature of 1400°F minimum is achieved by design of the facility. This is not a field adjustable parameter. Additionally, the primary chamber gas burners will not operate unless the secondary chamber (afterburner) is operating. Supplement 1 contained in the construction permit application describes in detail why afterburner temperature is not an operating variable and can be depended upon to be at least 1400°F.

   Since afterburner temperature is not an operating variable but predetermined by the design of the pyrolysis unit, it does not appear necessary to record the afterburner temperature every hour.

   Considering the small size of this pyrolysis oven, the establishment of data collection and recordkeeping procedures for temperature records and maintaining these records for two years does not seem to be justified.

   It is requested that Specific Condition 6 be deleted from Permit AC17-136188.

2. Specific Condition 9 requires detailed information on actual operation of the pyrolysis oven. Monsanto will comply with Department annual emissions reporting requirements. Annual report form 17-1.202(6) specifies the

information required. Therefore, it does not appear to be necessary to reiterate specific data collection needs in the construction permit's specific conditions.

The requirement to conduct annual visible emissions tests on a source as small as this pyrolysis oven, considering the system is designed to operate in compliance without manual adjustments, is not considered appropriate. Given a history of acceptable compliance tests after the facility is put into operation, the option should be available to reduce annual compliance tests to some periodic basis less than every year. Operating experience with similar units indicates that no visible emissions is routinely obtained.

It is requested that Specific Condition 9 be rewritten to address annual operating reports without itemizing the report form requirements and that the frequency of visible emissions test be required on a periodic basis as deemed appropriate by the District Office.

If you have any questions concerning these comments, please contact me at 904/968-8725.

Sincerely,

Bruce P. McLeod

Bruce P. McLeod
Senior Specialist
Environmental Engineering

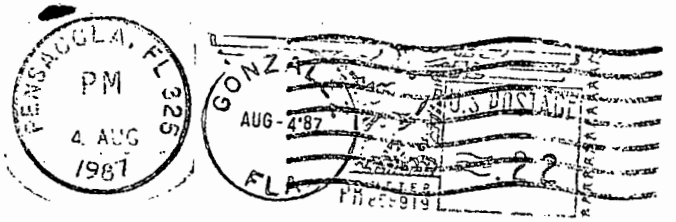
cc: J. G. Wiley, Monsanto, Pensacola

Copied: Willard Hanks
Jack Preece
Clair Fancy/
Bill Thomas
} 8/7/87

850.BPM

Monsanto

MONSANTO CHEMICAL COMPANY
P. O. Box 12830
Pensacola, Florida 32575



MR BILL THOMAS
BUREAU OF AIR QUALITY MANAGEMENT
DEPARTMENT OF ENVIRONMENTAL REGULATION
TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE FL 32301-8241

PS Form 3811, July 1983 447-845

SENDER: Complete items 1, 2, 3 and 4.

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

1. ☒ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:
Mr. W. J. Board
Monsanto Company
Post Office Box 12830
Pensacola, FL 32575

4. Type of Service:	Article Number
☐ Registered ☐ Insured ☒ Certified ☐ COD ☐ Express Mail	P 274 007 720

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
X *Lee Short*

7. Date of Delivery JUL 31 1987
JUL 31 1987

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

DOMESTIC RETURN RECEIPT

P 274 007 720

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

Sent to W.J. Board Monsanto Company	
Street and No. Post Office Box 12830	
P.O., State and ZIP Code Pensacola, FL 32575	
Postage 1	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date Mailed: July 30, 1987 Permit: AC 17-136188	

☆ U.S.G.P.O. 1985-480-794

PS Form 3800, June 1985

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

July 28, 1987

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. W. J. Board
Monsanto Company
Post Office Box 12830
Pensacola, Florida 32575

Dear Mr. Board:

Attached is one copy of the Technical Evaluation and Preliminary Determination, and proposed permit to construct a Model SCTR-15 Controlled Pyrolysis Cleaning Furnace at your existing facility in Escambia County, Florida.

Please submit, in writing, any comments which you wish to have considered concerning the Department's proposed action to Mr. Bill Thomas of the Bureau of Air Quality Management.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/ks

attachments

cc: Bruce P. McLeod, P.E.
Jack Preece

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of
Application for Permit by:

Monsanto Company
Post Office Box 12830
Pensacola, Florida 32575

DER File No. AC 57-136188

INTENT TO ISSUE

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

The applicant, Monsanto Company, applied on June 29, 1987, to the Department of Environmental Regulation for a permit to construct a Controlled Pyrolysis Cleaning Furnace at the applicant's facility in Escambia County, Florida.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes and Florida Administrative Code Rules 17-2 and 17-4. The project is not exempt from permitting procedures. The Department has determined that an air construction permit was needed for the proposed work.

Pursuant to Section 403.815, F.S. and DER Rule 17-103.150, FAC, you (the applicant) are required to publish at your own expense the enclosed Notice of Proposed Agency Action on permit application. The notice must be published one time only in a section of a major local newspaper of general circulation in the county in which the project is located and within thirty (30) days from receipt of this intent. Proof of publication must be provided to the Department within seven days of publication of

the notice. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

The Department will issue the permit with the attached conditions unless petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S. A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. Petitions must comply with the requirement of Florida Administrative Code Rules 17-103.155 and 28-5.201 (copies enclosed) and be filed with (received by) the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant must be filed within fourteen (14) days of receipt of this intent. Petitions filed by other persons must be filed within fourteen (14) days of publication of the public notice or within fourteen (14) days of receipt of this intent, whichever first occurs. 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, concerning the subject permit application. Petitions which are not filed in accordance with the above provisions will be dismissed.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

Copies furnished to:

W. J. Board
Bruce P. McLeod, P.E.
Jack Preece

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF INTENT TO ISSUE and all copies were mailed before the close of business on July 30, 1987.

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

Margaret V. Jones
Clerk

7/30/87
Date

State of Florida
Department of Environmental Regulation
Notice of Intent

The Department gives notice of its intent to issue a permit to construct a Controlled Pyrolysis Cleaning Furnance with afterburner at the applicant's existing facility near the intersection of State Roads 292 and 297 in Escambia County, Florida. A determination of Best Available Control Technology was not required. The emissions from the furnace will not have a significant impact on the ambient air quality.

Persons whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative determination (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Failure to file a petition within this time period constitutes a waiver of any right such person has to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

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 proposed agency action. Therefore, persons who may not wish to file a petition may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Rule 28-5.207, Florida Administrative Code, at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009, Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.

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

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

Department of Environmental Regulation
Northwest District
160 Governmental Center
Pensacola, Florida 32501

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

RULES OF THE ADMINISTRATIVE COMMISSION
MODEL RULES OF PROCEDURE
CHAPTER 28-5
DECISIONS DETERMINING SUBSTANTIAL INTERESTS

28-5.15 Requests for Formal and Informal Proceedings

(1) Requests for proceedings shall be made by petition to the agency involved. Each petition shall be printed, typewritten or otherwise duplicated in legible form on white paper of standard legal size. Unless printed, the impression shall be on one side of the paper only and lines shall be double spaced and indented.

(2) All petitions filed under these rules should contain:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name and address of the petitioner or petitioners;

(c) All disputed issues of material fact. If there are none, the petition must so indicate;

(d) A concise statement of the ultimate facts alleged, and the rules, regulations and constitutional provisions which entitle the petitioner to relief;

(e) A statement summarizing any informal action taken to resolve the issues, and the results of that action;

(f) A demand for the relief to which the petitioner deems himself entitled; and

(g) Such other information which the petitioner contends is material.

Technical Evaluation
and
Preliminary Determination

Monsanto Company
Pensacola, Florida
Escambia County

Controlled Pyrolysis Cleaning Furnace
File No. AC 17-136188

Florida Department of Environmental Regulation
Bureau of Air Quality Management
Central Air Permitting

July 29, 1987

I. Project Description

A. Applicant

Monsanto Company
P. O. Box 12830
Pensacola, Florida 32575

B. Project and Location

The company submitted an application for permit to construct a Model SCTR-15 Controlled Pyrolysis Cleaning Furnace (oven) equipped with an internal afterburner (incinerator) on June 29, 1987. This process equipment is also called the Vydyne® Pyrolysis oven. The application was considered complete on receipt. Industrial source codes are: SIC 4953; SCC 5-03-001-01 and 5-03-900-06.

This furnace is to be located at the existing site of the Monsanto Fibers and Intermediates Company in Escambia County. The facility is just north of Pensacola, Florida, at the intersection of State Roads 292 and 297; UTM coordinates: Zone 16, 479.96 km E and 3384.3 km N.

C. Process

The furnace will be used to remove 10,000 lbs/yr of nylon resin from process equipment by melting/burning. Batch operation (100 lbs/batch) of the furnace is used whereby up to 15 lbs/hr of nylon resin may be removed from the process equipment. The pieces of equipment to be cleaned are placed in the furnace which operates at approximately 800-900°F. A reducing condition exists in the furnace which allows the nylon resin to melt rather than burn. Some of the nylon resin in the furnace does sublimate, leaving the furnace and being destroyed by the afterburner.

The afterburner is designed to operate at approximately 1400-1500°F and receives all exhaust gases from the furnace. The afterburner operates in an oxidizing environment and burns the combustible gases from the furnace. The predominant products of the afterburner are CO_2 and water vapor. Small amounts of NOx, particulate matter, chlorides, and bromides are also produced and vented to the atmosphere.

The primary furnace is not operable unless the afterburner is in operation. Both the primary furnace and afterburner are fired on natural gas.

II. Rule Applicability

A. State Regulations

The proposed project, construction of a Controlled Pyrolysis Cleaning Furnace with an afterburner, is subject to pre-construction review under the provisions of Chapter 403, Florida Statutes, and 17-2 and 17-4, Florida Administrative Code (FAC).

The facility is situated in an area designated unclassifiable for sulfur dioxide (Rule 17-2.430, FAC) and attainment for all other criteria pollutants (Rule 17-2.420, FAC).

The plant is a major source of volatile organic compounds (Rule 17-2.100, FAC) as total emissions exceed 100 TPY. The proposed source will emit less than the significant emission rate of any criteria pollutant listed in Table 500-2.

The facility is exempt from the Prevention of Significant Deterioration (PSD) regulations because the modifications to the plant will not result in a significant net emission increase of any criteria pollutant (Rule 17-2.500(2)(d)4.a.(ii), FAC).

As the area in which the facility is located is designated attainment for all criteria pollutants, it is not subject to new source review for nonattainment areas (Rule 17-2.510(2)(a)1., FAC).

However, the facility is subject to Rule 17-2.520, FAC, which pertains to sources not subject to PSD or nonattainment requirements. Control of emissions shall be based on Rule 17-2.600(1)(a), FAC, emission standards for incinerators.

III. Technical Evaluation

A. Estimated Emissions

The proposed source will operate similary to a starved-air incinerator equipped with an afterburner.

The furnace is a two stage design with the primary chamber (oven) inoperable unless the secondary chamber (afterburner) is operating. Up to 10,000 lbs/yr of nylon resin on process equipment will be removed with this unit. The furnace, which is charged in the batch-feed mode, can process up to 100 pounds of nylon during one cycle. This nylon resin is processed at a rate up to 15 lbs/hr. The process equipment fouled with approximately 100 pounds of nylon resin is placed in the furnace whereby the reducing atmosphere inhibits combustion of volatiles while promoting a melt phase of the nylon resin. The melted nylon resin is collected below in a cooling chamber. The primary chamber (oven) is operated at 800-900°F and is fired on natural gas.

Smoke and a volatile fraction of the original nylon resin charge are produced in the oven and then routed to the secondary chamber (afterburner). The afterburner is designed to operate on natural gas at 1400-1500°F. This temperature and an oxidizing atmosphere allow for burning of the combustible products from the furnace stage. A retention time of one-half second is an operation parameter.

The effluent from the stack contains particulate matter, carbon dioxide, NOx, chloride, bromide, and water vapor. This is discharged to the atmosphere via a 20 foot high, 10 inch inside diameter stack.

B. Emissions Summary

Emissions were calculated assuming a worst case scenario where all nitrogen in the nylon resin is converted to NOx and particulate matter is twice that actually estimated with published emission factors. The chloride and bromide ions will be converted to acids in the atmosphere.

Polluant	Summary
Particulate Matter	0.61 lbs/hr (0.22 TPY)
Nitrogen Oxides	6.2 lbs hr (2.2 TPY)*
Hydrocarbon	0.75 lbs/hr (0.25 TPY)
Chloride ions**	1.5 lbs/hr (0.16 TPY)
Bromide ions	1.9 lbs/hr (0.21 TPY)

* Includes conversion of the nitrogen in the natural gas to NOx during combustion.
** 500 lbs/yr chloride containing additive in nylon fed to the oven

IV. Ambient Air Quality

When operated properly, the calculated emissions will not have a significant impact on the environment.

V. Conclusion

Based upon information contained in the application, the Department has concluded that the company can construct and operate this proposed furnace in compliance with all applicable air pollution control regulations. The Department proposes to issue a permit to construct the controlled pyrolysis cleaning furnace. The General and Specific Conditions listed in the proposed permit (attached) will assure compliance of the furnace with the Department's air pollution control regulations.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

PERMITTEE:
Monsanto Company
P. O. Box 12830
Pensacola, Florida 32575

Permit Number: AC 17-136188
Expiration Date: January 1, 1989
County: Escambia
Latitude/Longitude: 30° 35' 59" N
87° 14' 50" W
Project: Vydyne Pyrolysis Oven

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

For the construction of a SCTR-15 Controlled Pyrolysis Cleaning Furnace (Vydyne Pyrolysis Oven) at the existing facility located in Escambia County, north of Pensacola, Florida, at the intersection of State Roads 292 and 297. The UTM coordinates of this site are: Zone 16, 479.96 km E and 3384.3 km N.

Construction shall be in accordance with the permit application and plan, documents, amendments, and drawings submitted, except as noted in the Preliminary Determination or the Specific Conditions.

Attachments are as follows:

1. Application to construct air pollution sources, DER Form 17-1.202(1), which was received on June 29, 1987, by FDER Bureau of Air Quality Management.

PERMITTEE:
Monsanto Company

Permit Number: AC 17-136188
Expiration Date: January 1, 1989

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

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

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

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

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

GENERAL CONDITIONS:

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

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

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

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

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

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

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

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

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

PERMITTEE:
Monsanto Company

Permit Number: AC 17-136188
Expiration Date: January 1, 1989

GENERAL CONDITIONS:

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

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

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

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)
( ) Determination of Prevention of Significant Deterioration (PSD).
( ) Compliance with New Source Performance Standards.

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

GENERAL CONDITIONS:

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

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

1. Only nylon resin is to be pyrolyzed in this furnace.

2. The annual amount of nylon resin pyrolyzed shall not exceed 10,000 pounds.

3. Continuous operation of the nylon resin pyrolysis furnace is approved (8,760 hours annually).

4. Visible emissions (VE) shall not exceed 5% opacity during any 6 minute period. Compliance with this standard shall be determined by EPA Method 9, Visual Determination of the Opacity of Emissions from

PERMITTEE:
Monsanto Company

Permit Number: AC 17-136188
Expiration Date: January 1, 1989

SPECIFIC CONDITIONS:

Stationary Sources, as described in Appendix A of 40 CFR 60. If the visible emissions exceed 5% opacity, a Method 5 test, Determination of Particulate Emissions from Stationary Sources, may be required by the Department. The district office shall be notified 15 days prior to any compliance test.

5. Objectionable odors from the furnace shall not be allowed off plant property.

6. Afterburner temperature must exceed 1400° F when the furnace is in operation and the temperature shall be recorded a minimum of once per hour of operation. Temperature records shall be maintained at the plant for a minimum of 2 years for Department inspection.

7. Construction and operation shall reasonably conform to the plans submitted in the application. The applicant shall report any delay in construction of this project to the Department's Northwest District office.

8. The permittee shall submit a complete application for a permit to operate this furnace, which must include an emissions test report, to the DER Northwest District office at least 90 days prior to the expiration date of this construction permit. The permittee may continue to operate this source, if it is in compliance with all conditions of this construction permit, until its expiration date.

9. Upon obtaining a permit to operate, the permittee will be required to submit annual operation reports to the DER Northwest District office which shall include, as a minimum: the actual hours of operation; total tonnage of nylon material input; and an emissions test report for visible emissions as specified in Specific Condition No. 4.

Issued this_____day of_____, 19___

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

_____
Dale Twachtmann, Secretary

PTPLU6 7/16/87 MODEL RUN BY
Tom Rogers

Model input for Monsanto Oven Ac 17-[illegible]

Emission rate: 1.89×10^{-1} (0.189) g/sec (1.5 lb/hr)
Stack Height: 6.10 meters
Exit Temp: 1033.01 K
Exit Velocity: 0.93 m/sec
Stack Diam: 0.25 m
Vol flow: 4.72×10^{-2} (0.0472) m^3/sec

Results: Chloride ion, HCL = 1+35 = 36
Max 1hr impact is 265 (272 HCl) ug/m^3 Cl^- @ 0.156 KM (on polar property)
" 8 " 186 (191) Cl^- " " "
" 24 " 160 (165) Cl^- " " "

Bromide ion, HBr = 1+80 = 81
Max 1hr 265 (HCl) (1.9/1.5) = 337 (Br^-) ug/m^3
8hr 186 (") = 236 (Br^-) "
24hr 160 (") = 203 (Br^-) "

(1.5 lb/hr Cl^-) 1hr MAX IMPACT 0.8 KM = 65.7 ug/m^3 1-hr average
8hr " " " = (65.7)(0.7) = 46 ug/m^3

Max 8 hr impact HCL = (46)(36/35) = 47.3 ug/m^3
Max 8hr impact HBr = (46)(1.9/1.5)(81/80) = 59 ug/m^3

TLV HCL = 7,000 ug/m^3, 2% TLV = 140 ug/m^3
TLV HBr = 10,000 ug/m^3, 2% TLV = 200 ug/m^3

Conclusion: Conc. of HCL and HBr @ property line less than 2% TLV

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION)	Initial / Date
file (NSPS-13)	
2.	Initial / Date
3.	Initial / Date
4.	Initial / Date

REMARKS:

Bruce McLeod, Monsanto, called and said:

Cl and Br ions converted to HCL and HBr in the atmosphere when they mix with H_2O.

Ceiling limits for these acids are:

HCL - 7,000 ug/m³

HBr 10,000 ug/m³

Stack for oven is 2600 ft or 0.8 KM from plant property line

In an earlier conversation, Bruce the 500 lb/hr chloride additive on Calc. #4 of application should be 500 lb/yr.

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:

Willard Hanks

DATE 7-14-87

PHONE

C>

1 ISCST (DATED 86170)
AN AIR QUALITY DISPERSION MODEL IN
SECTION 1. GUIDELINE MODELS
IN UNAMAP (VERSION 6) JULY 86.
SOURCE: FILE 6 ON UNAMAP MAGNETIC TAPE FROM NTIS.

1

CALCULATE (CONCENTRATION=1, DEPOSITION=2)	ISW(1) = 1
RECEPTOR GRID SYSTEM (RECTANGULAR=1 OR 3, POLAR=2 OR 4)	ISW(2) = 1
DISCRETE RECEPTOR SYSTEM (RECTANGULAR=1, POLAR=2)	ISW(3) = 1
TERRAIN ELEVATIONS ARE READ (YES=1, NO=0)	ISW(4) = 0
CALCULATIONS ARE WRITTEN TO TAPE (YES=1, NO=0)	ISW(5) = 0
LIST ALL INPUT DATA (NO=0, YES=1, MET DATA ALSO=2)	ISW(6) = 2
COMPUTE AVERAGE CONCENTRATION (OR TOTAL DEPOSITION)	
WITH THE FOLLOWING TIME PERIODS:	
HOURLY (YES=1, NO=0)	ISW(7) = 1
2-HOUR (YES=1, NO=0)	ISW(8) = 0
3-HOUR (YES=1, NO=0)	ISW(9) = 0
4-HOUR (YES=1, NO=0)	ISW(10) = 0
6-HOUR (YES=1, NO=0)	ISW(11) = 0
8-HOUR (YES=1, NO=0)	ISW(12) = 0
12-HOUR (YES=1, NO=0)	ISW(13) = 0
24-HOUR (YES=1, NO=0)	ISW(14) = 0
PRINT 'N'-DAY TABLE(S) (YES=1, NO=0)	ISW(15) = 0
PRINT THE FOLLOWING TYPES OF TABLES WHOSE TIME PERIODS ARE	
SPECIFIED BY ISW(7) THROUGH ISW(14):	
DAILY TABLES (YES=1, NO=0)	ISW(16) = 0
HIGHEST & SECOND HIGHEST TABLES (YES=1, NO=0)	ISW(17) = 1
MAXIMUM 50 TABLES (YES=1, NO=0)	ISW(18) = 1
METEOROLOGICAL DATA INPUT METHOD (PRE-PROCESSED=1, CARD=2)	ISW(19) = 2
RURAL-URBAN OPTION (RU.=0, UR. MODE 1=1, UR. MODE 2=2, UR. MODE 3=3)	ISW(20) = 0
WIND PROFILE EXPONENT VALUES (DEFAULTS=1, USER ENTERS=2, 3)	ISW(21) = 1
VERTICAL POT. TEMP. GRADIENT VALUES (DEFAULTS=1, USER ENTERS=2, 3)	ISW(22) = 1
SCALE EMISSION RATES FOR ALL SOURCES (NO=0, YES)0)	ISW(23) = 0
PROGRAM CALCULATES FINAL PLUME RISE ONLY (YES=1, NO=2)	ISW(24) = 1
PROGRAM ADJUSTS ALL STACK HEIGHTS FOR DOWNWASH (YES=2, NO=1)	ISW(25) = 2
PROGRAM USES BUOYANCY INDUCED DISPERSION (YES=1, NO=2)	ISW(26) = 1
CONCENTRATIONS DURING CALM PERIODS SET = 0 (YES=1, NO=2)	ISW(27) = 2
REG. DEFAULT OPTION CHOSEN (YES=1, NO=2)	ISW(28) = 0
TYPE OF POLLUTANT TO BE MODELLED (1=SO2, 2=OTHER)	ISW(29) = 1
DEBUG OPTION CHOSEN (1=YES, 2=NO)	ISW(30) = 2
NUMBER OF INPUT SOURCES	NSOURC = 1
NUMBER OF SOURCE GROUPS (=0, ALL SOURCES)	NGROUP = 0
TIME PERIOD INTERVAL TO BE PRINTED (=0, ALL INTERVALS)	IPERD = 0
NUMBER OF X (RANGE) GRID VALUES	NXPNTS = 0
NUMBER OF Y (THETA) GRID VALUES	NYPNTS = 0
NUMBER OF DISCRETE RECEPTORS	NXWYPT = 48
NUMBER OF HOURS PER DAY IN METEOROLOGICAL DATA	NHOURS = 24
NUMBER OF DAYS OF METEOROLOGICAL DATA	NDAYS = 2
SOURCE EMISSION RATE UNITS CONVERSION FACTOR	TK=.10000E+07
HEIGHT ABOVE GROUND AT WHICH WIND SPEED WAS MEASURED	ZR = 7.00 METERS
LOGICAL UNIT NUMBER OF METEOROLOGICAL DATA	IMET = 5
ALLOCATED DATA STORAGE	LIMIT = 43500 WORDS
REQUIRED DATA STORAGE FOR THIS PROBLEM RUN	MIMIT = 848 WORDS

1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** X,Y COORDINATES OF DISCRETE RECEPTORS ***
(METERS)

(	.0,	100.0),	(	.0,	200.0),	(	.0,	300.0),	(	.0,	400.0),	(	.0,	500.0),
(	.0,	600.0),	(	.0,	700.0),	(	.0,	800.0),	(	.0,	900.0),	(	.0,	1000.0),
(	.0,	1100.0),	(	.0,	1200.0),	(	.0,	1300.0),	(	.0,	1400.0),	(	.0,	1500.0),
(	.0,	1600.0),	(	.0,	1700.0),	(	.0,	1800.0),	(	.0,	1900.0),	(	.0,	2000.0),
(	.0,	2100.0),	(	.0,	2200.0),	(	.0,	2300.0),	(	.0,	2400.0),	(	.0,	2500.0),
(	.0,	2600.0),	(	.0,	2700.0),	(	.0,	2800.0),	(	.0,	2900.0),	(	.0,	3000.0),
(	.0,	3100.0),	(	.0,	3200.0),	(	.0,	3300.0),	(	.0,	3400.0),	(	.0,	3500.0),
(	.0,	3600.0),	(	.0,	3700.0),	(	.0,	3800.0),	(	.0,	3900.0),	(	.0,	4000.0),
(	.0,	4100.0),	(	.0,	4200.0),	(	.0,	4300.0),	(	.0,	4400.0),	(	.0,	4500.0),
(	.0,	4600.0),	(	.0,	4700.0),	(	.0,	4800.0),	(					

1

*** MONSANTO OVEN — AC 17-136188 ***

*** SOURCE DATA ***

SOURCE NUMBER	TYPE	WAKE	NUMBER PART. CATS.	EMISSION RATE TYPE=0,1 (GRAMS/SEC) TYPE=2 (GRAMS/SEC) *PER METER**2	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	HEIGHT (METERS)	TEMP. TYPE=0 (DEG.K); VERT.DIM TYPE=1 (METERS)	EXIT VEL. TYPE=0 (M/SEC); HORZ.DIM TYPE=1,2 (METERS)	DIAMETER TYPE=0 (METERS)	BLDG. HEIGHT TYPE=0 (METERS)	BLDG. LENGTH TYPE=0 (METERS)	BLDG. WIDTH TYPE=0 (METERS)
10	0	0	0	.18900E+00	.0	.0	.0	6.10	1033.00	.93	.25	.00	.00	.00

1

MET. DATA
DAY 1

*** MONSANTO OVEN — AC 17-136188 ***

* METEOROLOGICAL DATA FOR DAY 1 *

HOUR	FLOW VECTOR (DEGREES)	WIND SPEED (MPS)	MIXING HEIGHT (METERS)	TEMP. (DEG. K)	POT. TEMP. GRADIENT (DEG. K PER METER)	STABILITY CATEGORY	WIND PROFILE EXPONENT	DECAY COEFFICIENT (PER SEC)
1	360.0	1.00	1000.0	293.0	.0000	1	.0700	.000000E+00
2	360.0	1.50	1000.0	293.0	.0000	1	.0700	.000000E+00
3	360.0	2.00	1000.0	293.0	.0000	1	.0700	.000000E+00
4	360.0	2.50	1000.0	293.0	.0000	1	.0700	.000000E+00
5	360.0	3.00	1000.0	293.0	.0000	1	.0700	.000000E+00
6	360.0	1.00	1000.0	293.0	.0000	2	.0700	.000000E+00
7	360.0	1.50	1000.0	293.0	.0000	2	.0700	.000000E+00
8	360.0	2.00	1000.0	293.0	.0000	2	.0700	.000000E+00
9	360.0	2.50	1000.0	293.0	.0000	2	.0700	.000000E+00
10	360.0	3.00	1000.0	293.0	.0000	2	.0700	.000000E+00
11	360.0	4.00	1000.0	293.0	.0000	2	.0700	.000000E+00
12	360.0	5.00	1000.0	293.0	.0000	2	.0700	.000000E+00
13	360.0	1.00	1000.0	293.0	.0000	3	.1000	.000000E+00
14	360.0	1.50	1000.0	293.0	.0000	3	.1000	.000000E+00
15	360.0	2.00	1000.0	293.0	.0000	3	.1000	.000000E+00

17	360.0	3.00	1000.0	293.0	.0000	3	.1000	.000000E+00
18	360.0	4.00	1000.0	293.0	.0000	3	.1000	.000000E+00
19	360.0	5.00	1000.0	293.0	.0000	3	.1000	.000000E+00
20	360.0	7.00	1000.0	293.0	.0000	3	.1000	.000000E+00
21	360.0	10.00	1000.0	293.0	.0000	3	.1000	.000000E+00
22	360.0	12.00	1000.0	293.0	.0000	3	.1000	.000000E+00
23	360.0	15.00	1000.0	293.0	.0000	3	.1000	.000000E+00
24	360.0	20.00	1000.0	293.0	.0000	3	.1000	.000000E+00

1 MET. DATA
DAY 2

* METEOROLOGICAL DATA FOR DAY 2 *

HOUR	FLOW VECTOR (DEGREES)	WIND SPEED (MPS)	MIXING HEIGHT (METERS)	TEMP. (DEG. K)	POT. TEMP. GRADIENT (DEG. K PER METER)	STABILITY CATEGORY	WIND PROFILE EXPONENT	DECAY COEFFICIENT (PER SEC)
1	360.0	1.00	1000.0	293.0	.0000	4	.1500	.000000E+00
2	360.0	1.50	1000.0	293.0	.0000	4	.1500	.000000E+00
3	360.0	2.00	1000.0	293.0	.0000	4	.1500	.000000E+00
4	360.0	2.50	1000.0	293.0	.0000	4	.1500	.000000E+00
5	360.0	3.00	1000.0	293.0	.0000	4	.1500	.000000E+00
6	360.0	4.00	1000.0	293.0	.0000	4	.1500	.000000E+00
7	360.0	5.00	1000.0	293.0	.0000	4	.1500	.000000E+00
8	360.0	7.00	1000.0	293.0	.0000	4	.1500	.000000E+00
9	360.0	10.00	1000.0	293.0	.0000	4	.1500	.000000E+00
10	360.0	12.00	1000.0	293.0	.0000	4	.1500	.000000E+00
11	360.0	15.00	1000.0	293.0	.0000	4	.1500	.000000E+00
12	360.0	20.00	1000.0	293.0	.0000	4	.1500	.000000E+00
13	360.0	2.00	1000.0	293.0	.0200	5	.3500	.000000E+00
14	360.0	2.50	1000.0	293.0	.0200	5	.3500	.000000E+00
15	360.0	3.00	1000.0	293.0	.0200	5	.3500	.000000E+00
16	360.0	4.00	1000.0	293.0	.0200	5	.3500	.000000E+00
17	360.0	5.00	1000.0	293.0	.0200	5	.3500	.000000E+00
18	360.0	1.00	1000.0	293.0	.0350	6	.5500	.000000E+00
19	360.0	1.50	1000.0	293.0	.0350	6	.5500	.000000E+00
20	360.0	2.00	1000.0	293.0	.0350	6	.5500	.000000E+00
21	360.0	2.50	1000.0	293.0	.0350	6	.5500	.000000E+00
22	360.0	3.00	1000.0	293.0	.0350	6	.5500	.000000E+00
23	360.0	4.00	1000.0	293.0	.0350	6	.5500	.000000E+00
24	360.0	5.00	1000.0	293.0	.0350	6	.5500	.000000E+00

1 HIGH
1-HR
SGROUP# 1

* HIGHEST 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER) *
* FROM ALL SOURCES *
* FOR THE DISCRETE RECEPTOR POINTS *

- X -	- Y -	CON.	(DAY,HOUR)	- X -	- Y -	CON.	(DAY,HOUR)
.0	100.0	279.12400	(1,13)	.0	200.0	237.61160	(2, 1)
.0	300.0	159.23320	(2, 1)	.0	400.0	109.14760	(2, 1)
.0	500.0	78.93470	(2, 1)	.0	600.0	65.04398	(2,18)
.0	700.0	67.35400	(2,18)	.0	800.0	65.66570	(2,18)
.0	900.0	62.75878	(2,18)	.0	1000.0	59.30507	(2,18)
.0	1100.0	55.61090	(2,18)	.0	1200.0	52.04802	(2,18)

.0	1500.0	42.69140	(2,18)	.0	1600.0	40.04679	(2,18)
.0	1700.0	37.62249	(2,18)	.0	1800.0	35.40172	(2,18)
.0	1900.0	33.36694	(2,18)	.0	2000.0	31.50107	(2,18)
.0	2100.0	29.83825	(2,18)	.0	2200.0	28.31339	(2,18)
.0	2300.0	26.91156	(2,18)	.0	2400.0	25.61981	(2,18)
.0	2500.0	24.42679	(2,18)	.0	2600.0	23.32256	(2,18)
.0	2700.0	22.29836	(2,18)	.0	2800.0	21.34648	(2,18)
.0	2900.0	20.46011	(2,18)	.0	3000.0	19.63325	(2,18)
.0	3100.0	18.89008	(2,18)	.0	3200.0	18.19430	(2,18)
.0	3300.0	17.54174	(2,18)	.0	3400.0	16.92870	(2,18)
.0	3500.0	16.35186	(2,18)	.0	3600.0	15.80827	(2,18)
.0	3700.0	15.29527	(2,18)	.0	3800.0	14.81049	(2,18)
.0	3900.0	14.35176	(2,18)	.0	4000.0	13.91715	(2,18)
.0	4100.0	13.50490	(2,18)	.0	4200.0	13.11339	(2,18)
.0	4300.0	12.74120	(2,18)	.0	4400.0	12.38698	(2,18)
.0	4500.0	12.04953	(2,18)	.0	4600.0	11.72774	(2,18)
.0	4700.0	11.42060	(2,18)	.0	4800.0	11.12719	(2,18)

1

2ND HIGH
1-HR
SGROUP# 1

*** MONSANTO OVEN -- AC 17-136188 ***

* SECOND HIGHEST 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER) *
* FROM ALL SOURCES *
* FOR THE DISCRETE RECEPTOR POINTS *

- X -	- Y -	CON.	(DAY,HOUR)	- X -	- Y -	CON.	(DAY,HOUR)
.0	100.0	234.12510	(1,14)	.0	200.0	189.26600	(2, 2)
.0	300.0	116.11860	(2, 2)	.0	400.0	77.00729	(2, 2)
.0	500.0	57.49050	(2,18)	.0	600.0	59.74009	(2, 1)
.0	700.0	54.71091	(2,19)	.0	800.0	51.85212	(2,19)
.0	900.0	48.47224	(2,19)	.0	1000.0	45.00260	(2,19)
.0	1100.0	41.64068	(2,19)	.0	1200.0	38.54311	(2,19)
.0	1300.0	35.72177	(2,19)	.0	1400.0	33.16684	(2,19)
.0	1500.0	30.85885	(2,19)	.0	1600.0	28.77497	(2,19)
.0	1700.0	26.89202	(2,19)	.0	1800.0	25.18813	(2,19)
.0	1900.0	23.64330	(2,19)	.0	2000.0	22.23960	(2,19)
.0	2100.0	21.00570	(2,19)	.0	2200.0	19.88068	(2,19)
.0	2300.0	18.85175	(2,19)	.0	2400.0	17.90803	(2,19)
.0	2500.0	17.04015	(2,19)	.0	2600.0	16.23997	(2,19)
.0	2700.0	15.50042	(2,19)	.0	2800.0	14.81535	(2,19)
.0	2900.0	14.17935	(2,19)	.0	3000.0	13.58771	(2,19)
.0	3100.0	13.05908	(2,19)	.0	3200.0	12.56512	(2,19)
.0	3300.0	12.10270	(2,19)	.0	3400.0	11.66903	(2,19)
.0	3500.0	11.26163	(2,19)	.0	3600.0	10.87831	(2,19)
.0	3700.0	10.51709	(2,19)	.0	3800.0	10.17620	(2,19)
.0	3900.0	9.85406	(2,19)	.0	4000.0	9.54923	(2,19)
.0	4100.0	9.26043	(2,19)	.0	4200.0	8.98647	(2,19)
.0	4300.0	8.72630	(2,19)	.0	4400.0	8.47895	(2,19)
.0	4500.0	8.24354	(2,19)	.0	4600.0	8.01927	(2,19)
.0	4700.0	7.80541	(2,19)	.0	4800.0	7.60127	(2,19)

MAX 50
1-HR
SGROUP# 1

*** MONSANTO OVEN -- AC 17-136188 ***

* 50 MAXIMUM 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER) *

RANK	CON.	HOUR	DAY	X OR RANGE (METERS)	Y (METERS) OR DIRECTION (DEGREES)	RANK	CON.	HOUR	DAY	X OR RANGE (METERS)	Y (METERS) OR DIRECTION (DEGREES)
1	279.12400	13	1	.0	100.0	26	109.14760	1	2	.0	400.0
2	237.61160	1	2	.0	200.0	27	101.71990	14	1	.0	200.0
3	234.12510	14	1	.0	100.0	28	98.90505	8	2	.0	100.0
4	223.82780	2	2	.0	100.0	29	94.16308	9	1	.0	100.0
5	215.54260	3	2	.0	100.0	30	91.49163	19	1	.0	100.0
6	198.70170	4	2	.0	100.0	31	90.59789	3	2	.0	300.0
7	195.44160	1	2	.0	100.0	32	89.82191	2	1	.0	100.0
8	194.54650	15	1	.0	100.0	33	85.34567	6	2	.0	200.0
9	193.56790	6	1	.0	100.0	34	79.89728	10	1	.0	100.0
10	189.26600	2	2	.0	200.0	35	78.93470	1	2	.0	500.0
11	181.31700	5	2	.0	100.0	36	78.57243	15	1	.0	200.0
12	164.81070	16	1	.0	100.0	37	77.00729	2	2	.0	400.0
13	159.23320	1	2	.0	300.0	38	76.91956	13	1	.0	300.0
14	153.62560	3	2	.0	200.0	39	74.08647	4	2	.0	300.0
15	151.63990	6	2	.0	100.0	40	73.19924	6	1	.0	200.0
16	144.91810	7	1	.0	100.0	41	72.80738	9	2	.0	100.0
17	142.67540	13	1	.0	200.0	42	69.59319	7	2	.0	200.0
18	142.42790	17	1	.0	100.0	43	69.40210	3	1	.0	100.0
19	129.18080	7	2	.0	100.0	44	67.35400	18	2	.0	700.0
20	128.43880	4	2	.0	200.0	45	67.16508	20	1	.0	100.0
21	125.90780	1	1	.0	100.0	46	65.66570	18	2	.0	800.0
22	116.11860	2	2	.0	300.0	47	65.04398	18	2	.0	600.0
23	114.39910	8	1	.0	100.0	48	63.89469	16	1	.0	200.0
24	111.55420	18	1	.0	100.0	49	62.75878	18	2	.0	900.0
25	110.06660	5	2	.0	200.0	50	62.60229	5	2	.0	300.0

Monsanto

MONSANTO CHEMICAL COMPANY
P. O. Box 12830
Pensacola, Florida 32575
Phone: (904) 968-7000

DER

JUN 29 1987

BAQM

June 26, 1987

Mr. Clair Fancy
Bureau of Air Quality Management
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Fancy:

Enclosed are four (4) copies of an air pollution construction permit application for a pyrolysis oven at the Monsanto, Pensacola, plant. Also enclosed is a check for $100 to cover the construction permit application fee.

If you have any questions concerning the information contained in this permit application, please call me at 904/968-8725.

Sincerely,

Bruce P McLeod

Bruce P. McLeod
Senior Specialist
Environmental Control

Enclosures

copied:
Jack Preece } 6/29/87
BT + CHF

803.JGW

Distribution:

CONSIGNEE COPY

Received 6/29/87

Monsanto

COMPANY

P. O. BOX 12830

PENSACOLA, FLORIDA 32575

SHIPMENT REQUEST & REPORT

SHIPMENT NO. 71688

DATE 6/26/87 TO BLDG. 710

ATTN: E. M. Brown

FROM T. L. Brooks

MATERIAL FROM:

FROM B. McLeod EXT. 8725 BLDG. 601 ROOM 201

SHIPMENT AUTHORIZED BY J. G. Hiley

PURCHASE ORDER REF:

DATE SHIPPED: 6/26/87

VIA: EMERY

PRO. NO. GROSS WT.

AMT. P. P. D. XXX AMT. COL.

F. O. B.

NO. PKGS.

QTY. REQUESTED	QTY. SHIPPED	UNIT	DESCRIPTION
1	1	each	Envelope containing 4 copies of air pollution permit application...

SHIP TO: CLAIR FANCY
BUREAU OF AIR QUALITY MGT
Dept. of Envir. Reg.
2600 Blair Stone Rd.
Tallahassee, FL 32301

EST. SHIPPING WT. 20

SHIP VIA EMERY (MONDAY) COLLECT ☐ PREPAID ☒

CHARGE TRANSPORTATION COST TO ACCOUNT NUMBER 0271

INSURE FOR DECLARED VALUE

RETURN TO VENDOR FOR ☐ CREDIT ☐ REPLACEMENT ☐ REPAIRS ☐ NOT TO BE REPLACED

SPECIAL INSTRUCTIONS:

Monday delivery.....

SHIPMENT COMPLETED BY E M Brown DATE 6-26-87

SHIPPING CLERK COMMENTS

CREDIT ACCT: DEBIT ACCT: VENDOR'S INVOICE

PTN 124.04.83-6
01 16 104

MONSANTO P. O. BOX 12830
PENSACOLA, FLORIDA 32575

REFERENCE:

TO

MR CLAIR FANCY
BUREAU OF AIR QUALITY MGT
DEPARTMENT OF ENV REGULATION
2600 BLAIR STONE ROAD
TALLAHASSEE FL 32301

YN- 4402.04.67-2

RETURN POSTAGE GUARANTEED

Monsanto

WORKING FUND ACCOUNT
MONSANTO COMPANY
PENSACOLA, FLORIDA

720 08551

62-20
311

06/24/87

$100.00

EXACTLY PAY ONE HUNDRED DOLLARS

PAY TO THE ORDER OF DEPARTMENT OF ENVIRONMENTAL REGULATION

Citibank (Delaware)

C. K. Simmons
Maria A. Sabellano

[redacted]

MONSANTO COMPANY, PENSACOLA, FLORIDA

720 08551

P-25 06/24/87 THE ATTACHED CHECK IS IN PAYMENT OF THE FOLLOWING:

DEPARTMENT OF ENVIRONMENTAL REGULATION

MEMO	DATE	INVOICE NO.	AMOUNT	DEDUCTIONS & DISCOUNT	NET
Construction permit application fee for Nylon Resin (Vydyne) Burnout Furnace - B. McLeod.	06/24/87		$100.00		$100.00

DETACH BEFORE DEPOSITING

CH 142

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

No. 76172

RECEIPT FOR APPLICATION FEES AND MISCELLANEOUS REVENUE

Received from Monsanto Company Date June 29, 1987

Address P.O. Box 12830, Pensacola, FL 32575 Dollars $ 100.00

Applicant Name & Address W.J. Board, P.O. Box 12830, Pensacola, FL 32575

Source of Revenue √# 720008551

Revenue Code 001031 Application Number AC 17-136188

By Margaret Crane

AC 17-136188
$100.00

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHWEST DISTRICT
160 GOVERNMENTAL CENTER
PENSACOLA, FLORIDA 32501

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Construction [X] New[1] [ ] Existing[1]

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

COMPANY NAME: Monsanto Company COUNTY: Escambia

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) Vydyne Pyrolysis Oven

SOURCE LOCATION: Street Intersection State Roads 292 & 297 City

UTM: East North

Latitude 30 ° 35 ' 28 "N Longitude 87 ° 14 ' 25 "W

APPLICANT NAME AND TITLE: W. J. Board, S.E. Dir., Governmental Affairs

APPLICANT ADDRESS: P. O. Box 12830, Pensacola, FL 32575

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Monsanto Company

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: W J Board

W. J. Board, S.E. Dir., Gov. Affairs
Name and Title (Please Type)

Date: Telephone No. (904)968-7350

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

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

Bruce P. McLeod, P.E.
Name (Please Type)

Monsanto Company
Company Name (Please Type)

P. O. Box 12830, Pensacola, FL 32575
Mailing Address (Please Type)

Florida Registration No. 26956 Date: 6/24/87 Telephone No. (904)968-8725

SECTION II: GENERAL PROJECT INFORMATION

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.

Purchase and install a pyrolysis oven with integral afterburner. Unit will be a Pollution Control Products Co. unit SCTR 15 (See attached brochure).

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

Start of Construction upon permit receipt Completion of Construction 1 yr. after permit

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.)

No separate pollution control systems. Afterburner is integral to the pyrolysis unit.

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

Similar units authorized under permits AC17-104180 and AC17-127872

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;

if power plant, hrs/yr _____; 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? _____

   b. If yes, has "Lowest Achievable Emission Rate" been applied? _____

   c. If yes, list non-attainment pollutants. _____

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? No

   a. If yes, for what pollutants? _____

   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.

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

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

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
Nylon Resin			15 lbs/hr	
			10,000 lbs/ yr.	

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

1. Total Process Input Rate (lbs/hr): _____

2. Product Weight (lbs/hr): _____

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

Name of Contaminant	Emission[1] (See Note)		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	
NOx	6.2	2.2	N/A	N/A	6.2	2.2	
Particulates	0.6	0.2	N/A	N/A	0.6	0.2	
Hydrocarbons	0.8	0.3	N/A	N/A	0.8	0.3	
Opacity	5% or less		17.2.600 (1)	5%	N/A		
Chloride + Bromide ions	3.4	0.4	N/A	N/A	3.4	0.4	

[1] See Section V, Item 2.

[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).

Note: See calculations 1,2,3 and 4 attached.
* Control devices integral to the process so actual = potential emissions.

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)

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

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

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: _____ 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 _____ Maximum _____

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

_____

_____

_____

_____

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

tack Height: _____ ft. Stack Diameter: _____ ft.

as Flow Rate: _____ ACFM _____ DSCFM Gas Exit Temperature: _____ °F.

ater Vapor Content: _____ % Velocity: _____ FPS

SECTION IV: INCINERATOR INFORMATION

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)							

escription of Waste Nylon Polymer Resin

otal Weight Incinerated (lbs/hr) See Supplement 2 Design Capacity (lbs/hr) See Supplement 2

pproximate Number of Hours of Operation per day 24 day/wk 7 wks/yr. 52

anufacturer Pollution Control Products Co., Dallas, Texas

ate Constructed _____ Model No. IGG-391

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel Type	Fuel BTU/hr	Temperature (°F)
Primary Chamber	391 $ft.^3$	approx. 180,000	nat. gas	approx. 180,000	800 F
Secondary Chamber	9.5 $ft.^3$	approx. 180,000	nat. gas	approx. 180,000	1400 F

Stack Height: 20 min. ft. Stack Diamter: approximately 14" OD, 10" ID Stack Temp. 1400 F

Gas Flow Rate: 350-400 @ 1400°F ACFM approx 100 DSCFM* Velocity: approx 5 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) _____

Brief description of operating characteristics of control devices:

The exhaust from the oven passes through the afterburner which is controlled between 1400-1500°F by controlling the rate of nylon degradation by means of a variable rate water quench spray.

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

Any ash residue from the nylon would be disposed of in compliance with solid waste and RCRA regulations.

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.

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

3. 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

. 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

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

[ ] Yes [ ] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration

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

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

xplain method of determining

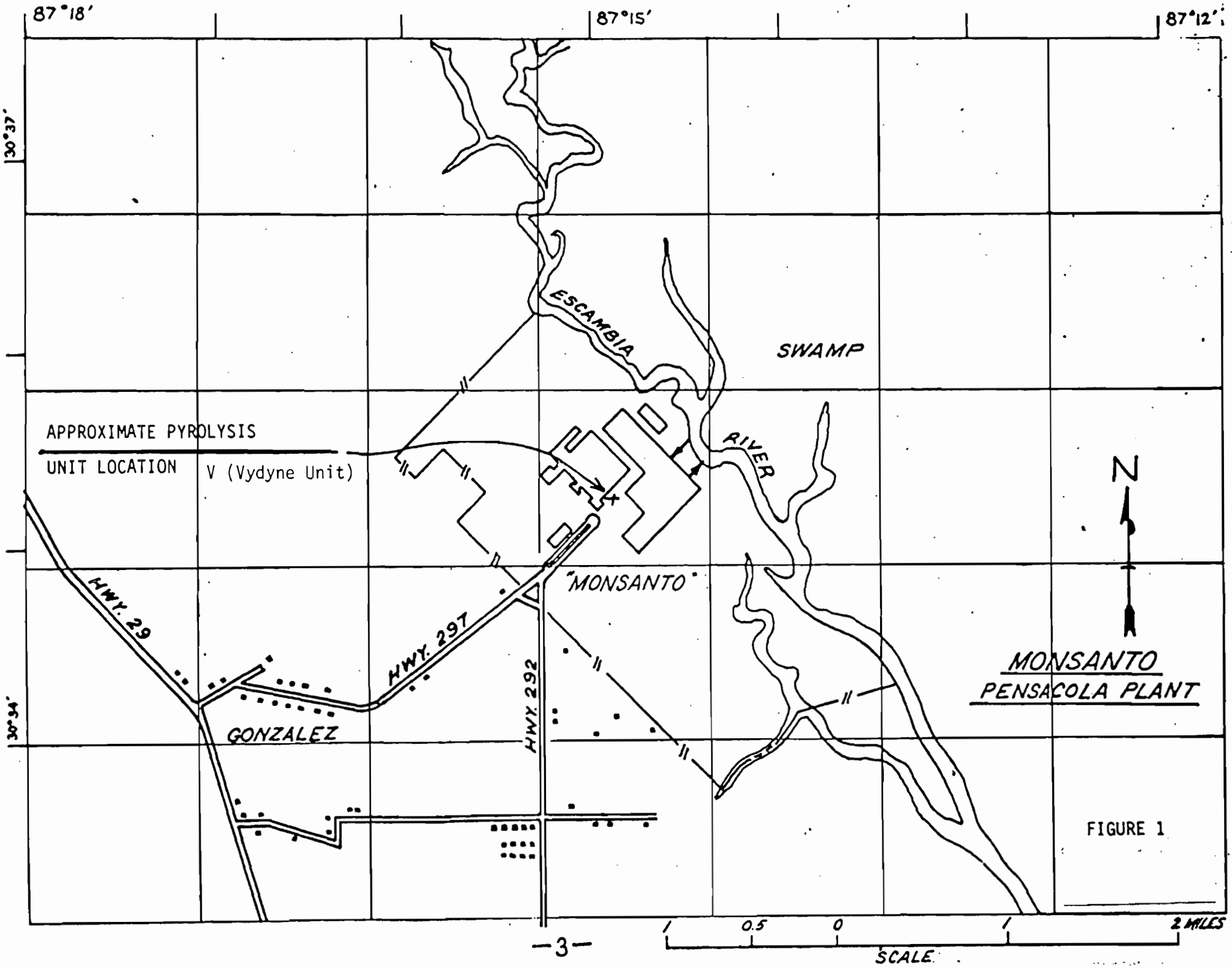

87°18'
87°15'
87°12'
30°37'
30°34'
ESCAMBIA
SWAMP
RIVER
APPROXIMATE PYROLYSIS
UNIT LOCATION V (Vydyne Unit)
"MONSANTO"
HWY. 29
HWY. 297
HWY. 292
GONZALEZ
N
MONSANTO
PENSACOLA PLANT
0.5
0
2 MILES
SCALE

FIGURE 1

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:

. 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:

Explain method of determining efficiency.
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

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

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)_____

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.

. Applicants Maximum Allowable Emission Data

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

. 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.

. Attach all other information supportive to the PSD review.

. 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.

. 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.

SECTION V SUMMARY

Item 1. Not applicable
See Supplement 1

Item 2. See Supplements 1 & 2 and
Calculations 1 & 3

Item 3. Noted in Section III-C footnote

Item 4. See Supplements 1 & 2

Item 5. See Supplement 2

Item 6. See Supplement 1

Item 7. See Figure 1

Item 8. See Figure 1

CALCULATION #1

MONSANTO PENSACOLA
NYLON RESIN EQUIPMENT

Calculation of NOx emission from natural gas burning - reference section 1.4-2, AP42.

NOx factor: $\frac{100 \text{ lb. NOx}}{10^6 \text{ ft.}^3 \text{ gas}}$ (from AP-42)

Heat input: $\frac{360{,}000 \text{ Btu}}{\text{Hr.}} = \frac{346 \text{ ft}^3 \text{ gas}}{\text{Hr.}}$

Lbs. NOx = $\frac{346 \text{ ft}^3 \text{ gas}}{\text{Hr.}} \times \frac{100 \text{ lbs. NOx}}{10^6 \text{ ft}^3 \text{ gas}}$

$\frac{0.036 \text{ lb.NOx}}{\text{Hr.}} = \frac{.16 \text{ tons NOx}}{\text{Yr.}}$

Maximum NOx = 2 x expected NOx = 2 x 0.036 = $\frac{0.07 \text{ lb. NOx}}{\text{Hr.}}$

Calculation of NOx from organic nitrogen (assuming all organic nitrogen converted to NOx)

$\frac{15 \text{ lb.}}{\text{Hr.}} \times \frac{28}{226}$ (fraction nitrogen in nylon) x

$\frac{46 \text{ (MW NOx)}}{14 \text{ (MW Nitrogen)}} = \frac{6.1 \text{ lb. NOx}}{\text{Hr.}}$

$\frac{10{,}000 \text{ lb nylon.}}{\text{Yr.}} \times \frac{28}{226} \times \frac{46}{14} \times \frac{1 \text{ ton}}{2{,}000 \text{ lbs.}} =$

2.0 tons/year

SECTION III C EMISSIONS

Maximum hourly lbs/hr. NOx = 0.07 + 6.1 = 6.2 lb./hr. NOx

Actual tons/yr. NOx = 0.16 + 2.0 = 2.2 tons/yr. NOx

CALCULATION #2

MONSANTO PENSACOLA

NYLON POLYMERIZATION EQUIPMENT

Calculation of particulate emission from natural gas burning; reference section 1.4-2, AP 42.

Particulates factor: $\frac{10 \text{ lb. particulates}}{10^6 \text{ ft.}^3 \text{ gas}}$

Heat input = $\frac{360{,}000 \text{ Btu}}{\text{Hr.}}$ = $\frac{346 \text{ ft.}^3 \text{ gas}}{\text{Hr.}}$

Lb. particulates = $\frac{346 \text{ ft.}^3 \text{ gas}}{\text{Hr.}}$ x $\frac{10 \text{ lb. NOx}}{10^6 \text{ ft.}^3 \text{ gas}}$ =

.0036 lb./hr. particulates = 0.02 tons/year

Maximum hourly particulates = 2 x expected particulates =

.007 lb./hr.

Calculation of particulate emissions from nylon resin combustion.

15 $\frac{\text{lb}}{\text{hr}}$ nylon resin x (.40 fraction inorganic additive)

x (.10 fraction airborne particulate)

= .6 $\frac{\text{lb.}}{\text{hr}}$ particulate

10,000 $\frac{\text{lb}}{\text{yr}}$ x .4 x .1 x $\frac{1 \text{ ton}}{2{,}000 \text{ lbs}}$ = .2 $\frac{\text{ton}}{\text{yr.}}$

Total particulate emissions from natural gas and nylon resin.

Maximum hourly emissions = .007 + .6 $\frac{\text{lb}}{\text{hr}}$ = .61 $\frac{\text{lb}}{\text{hr}}$ particulate

Maximum annual emissions = .02 + .2 $\frac{\text{tons}}{\text{yr}}$ = .22 $\frac{\text{tons/yr}}{\text{particulate}}$

CALCULTION #3

MONSANTO PENSACOLA

NYLON RESIN EQUIPMENT

Calculation of Hydrocarbon Emissions

Annual Amount

$$10{,}000 \frac{lb}{yr} \text{ nylon resin} \times (1.00 - .95)^{*} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = .25 \frac{\text{tons}}{\text{year}}$$

Hourly Rate

$$15 \frac{lb}{hr} \text{ nylon resin} \quad (.05) = .75 \frac{lb}{hr} \text{ hydrocarbon emission}$$

* Assuming 95% efficiency

CALCULATION #4

MONSANTO PENSACOLA

NYLON RESIN EQUIPMENT

Annual usage of chloride contining additive = approximately 500 $\frac{lb}{hr}$.

= 0.16 tons/yr chloride

Maximum hourly emission = 15 lb/HR x (.15 approximate concentration factor) x (.65)

= 1.5 lb/hr chloride ion

Annual usage of Bromide containing additive

= approximately 500 $\frac{lb}{yr}$ = approximately 83% Bromine

= .21 $\frac{tons}{year}$ Bromide ion

Maximum hourly emission

15 $\frac{lb}{hr}$ x (.15 approximate concentration factor) x (.83)

= 1.9 $\frac{lb}{hr}$ Bromide ion

SUPPLEMENT #1

MONSANTO, PENSACOLA

DISCUSSION OF NYLON RESIN POLYMER OVEN

AFTERBURNER CONTROL

Gas flow and air flow are held constant in both the oven section (primary chamber) and in the afterburner section (secondary chamber).

The afterburner temperature is factory set to achieve 1400° minimum temperature. This is not a field adjustable parameter.

As pyrolysis gases reach the afterburner, the afterburner temperature rises because of the heating value of these materials.

Pyrolysis rate in the primary chamber is controlled by water quenching. The rate of water flow is adjusted to maintain 1400-1500° afterburner temperature.

The primary chamber gas burners will not operate unless the secondary chamber (afterburner) burners are operating.

PROCESS DESCRIPTION

External oven dimensions are 18" wide x 180" long x 10" high. Nylon is heated in the primary chamber to between 800-900°F where it degrades to volatile compounds. These materials exit through the afterburner which provides 1/2 second residence time at a minimum temperature of 1400°F.

INCINERATION RATE

Maximum nylon per charge is 100 lbs. Maximum nylon resin burn off rate is 15 lbs./hr. Maximum annual nylon resin incineration capacity is 10,000 lbs.

SUPPLEMENT #2

MONSANTO PENSACOLA

DISCUSSION OF AFTERBURNER EFFICIENCY

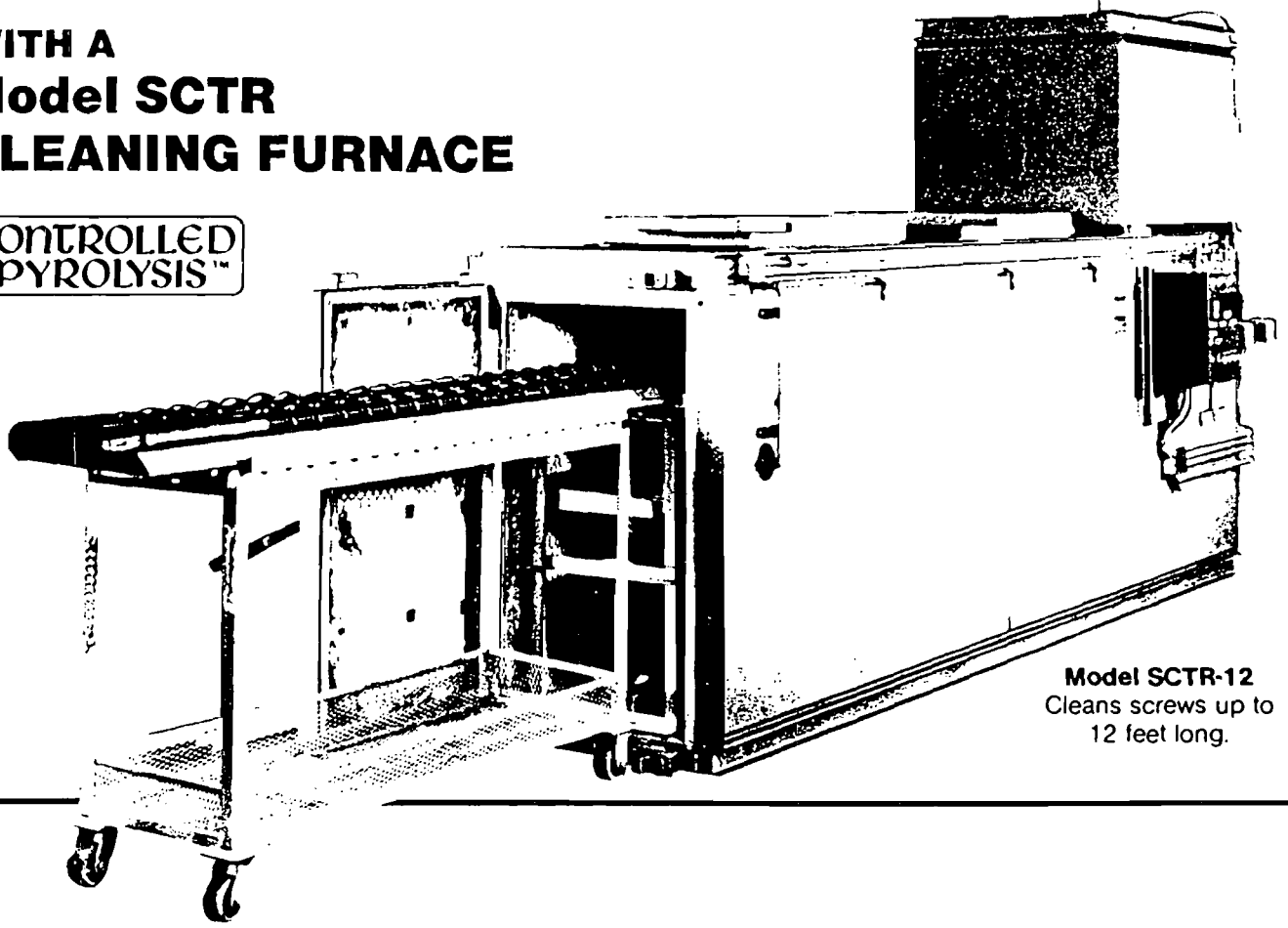
See pages 172 and 181 (attached) from the Air Pollution Engineering Manual, Publication AP-40, US-EPA.

These sections show that 1/2 second residence time at a minimum of 1400°F can be expected to yield 95+% destruction efficiency.

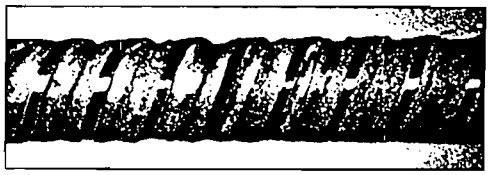
CLEAN EXTRUSION AND INJECTION MOLDING SCREWS

WITH A Model SCTR CLEANING FURNACE

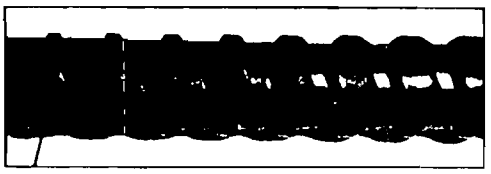
CONTROLLED PYROLYSIS™



Model SCTR-12
Cleans screws up to 12 feet long.



BEFORE



AFTER

- REDUCE LABOR COSTS OF TEDIOUS, MANUAL, HAND-CLEANING METHODS.
- ELIMINATE DAMAGE TO SCREWS CAUSED BY WIRE-BRUSHING, CHISELING, OR HAND-TORCHING.
- AUTOMATED CLEANING PROCESS
- NEW PATENTED LOW-COST TECHNOLOGY (U.S. PATENTS 4,557,203 & 4,270,898)
- POLLUTION-FREE

POLLUTION CONTROL PRODUCTS CO.

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CONTROLLED PYROLYSIS
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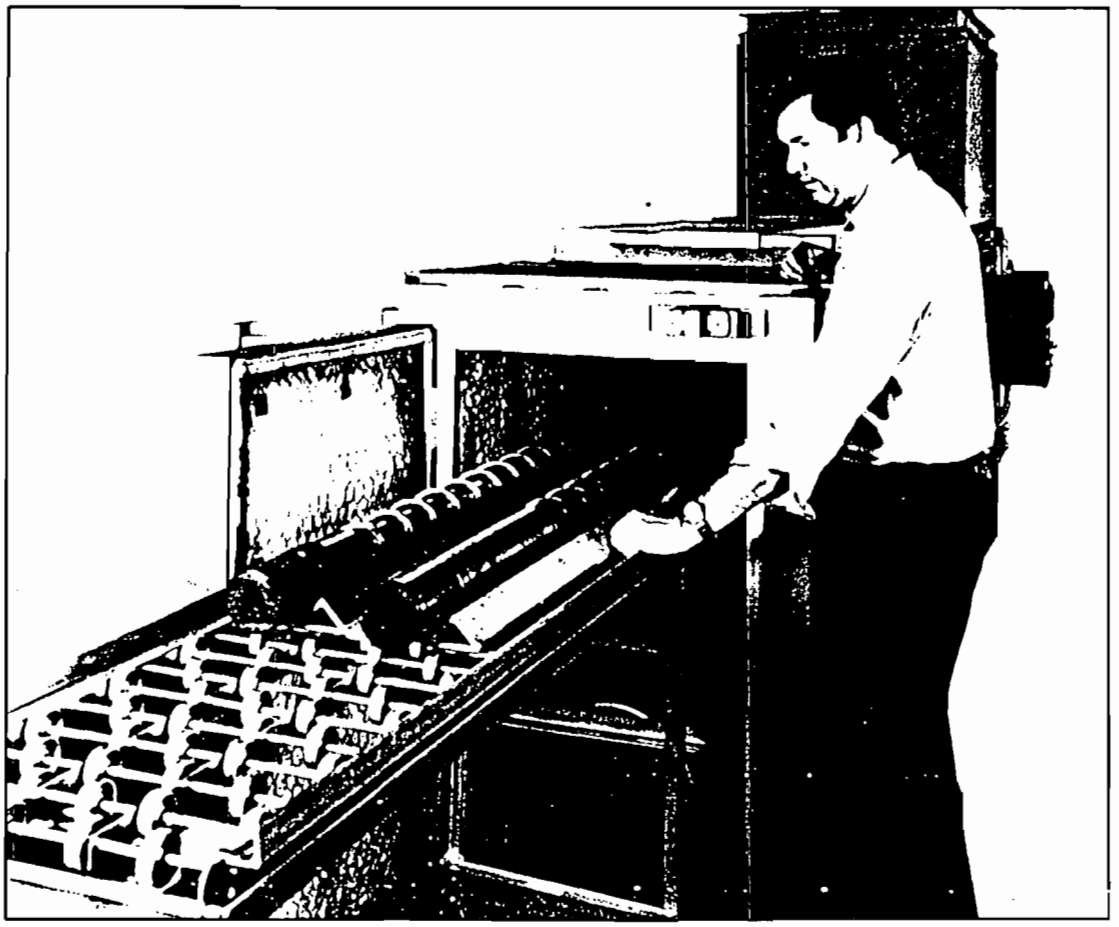
CLEANING METHODS FOR THE 80'S . . . AND BEYOND

CLEAN YOUR SCREWS THE EASY WAY

WITH A

CONTROLLED PYROLYSIS™

MODEL SCTR CLEANING FURNACE



NEW CONVEYOR DESIGN

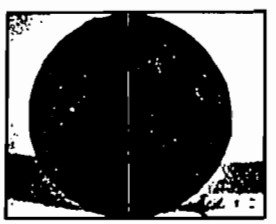
- Makes loading and unloading of screws an easy, one-man job.
- Screws are removed from the extruder machines and loaded on top of a loading cart.
- Rolling cart is used to carry the screws to the cleaning furnace.
- Screws roll smoothly into the furnace using a special carrier for support.
- After cleaning cycle is over and screws have cooled down, screw-carrier rolls out of furnace onto top of rolling cart.

SMALLEST MODEL, SCTR-6 CLEANS SCREWS UP TO 6 FEET LONG AND UP TO 8 INCHES IN DIAMETER.

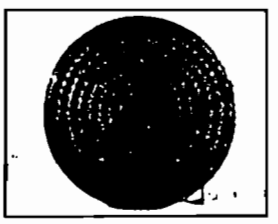
OTHER MODELS HANDLE LENGTHS UP TO 9, 12, AND 15 FEET.

AUTOMATED CLEANING CYCLE REDUCES LABORIOUS HAND-CLEANING.

BEFORE



AFTER

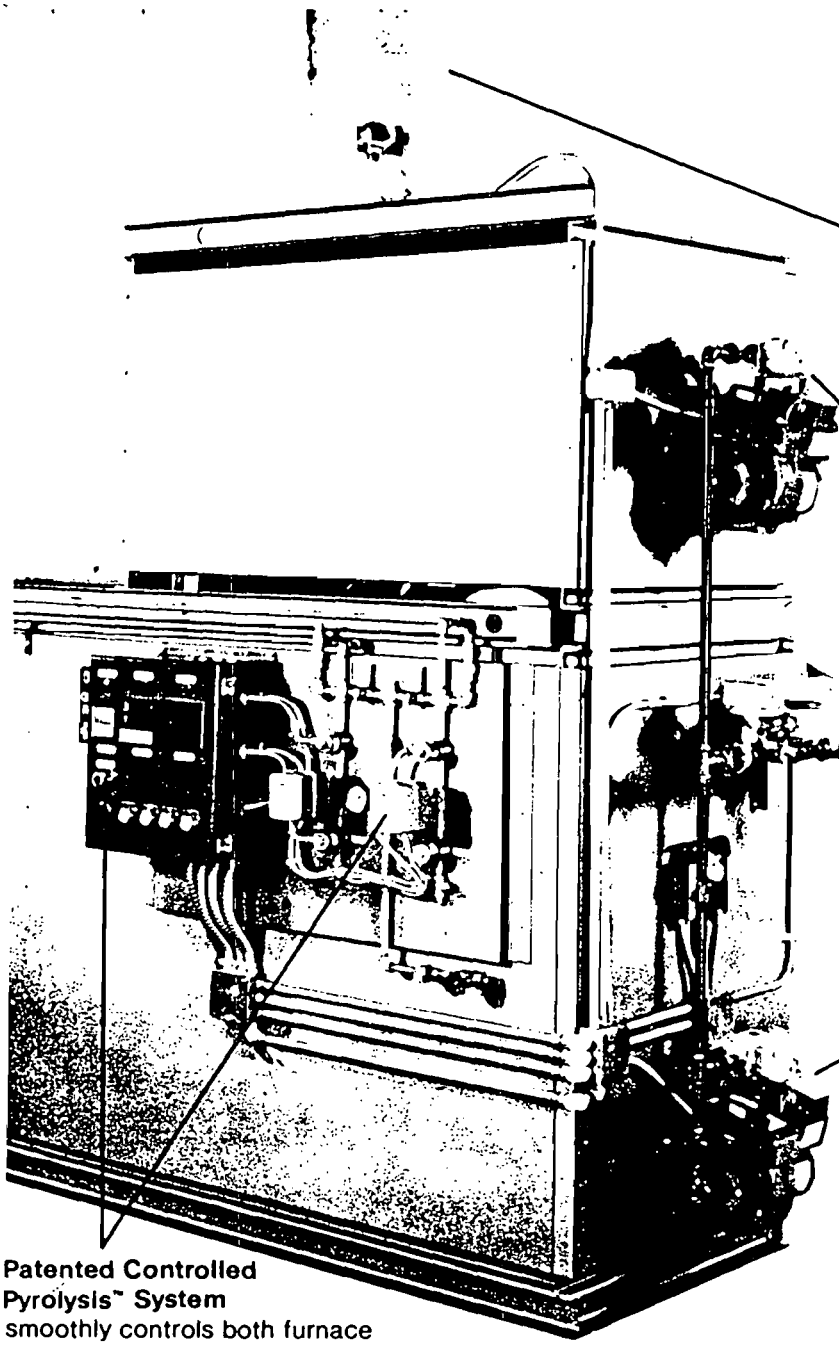


Breaker plates, nozzles, dies and other smaller parts can also be cleaned in these units.

PCP POLLUTION CONTROL PRODUCTS CO.

TM REG. U.S. PAT OFFICE

HOW SCTR CLEANING FURNACES WORK:



Patented Controlled Pyrolysis™ System smoothly controls both furnace and stack gas temperatures to ensure safe, pollution-free cleaning process.

AUTOMATED CLEANING PROCESS

Clean furnace gases vent to outdoors through insulated stack. Gases consist primarily of carbon dioxide and water vapor which are invisible, odorless, and harmless.

Gas burner consumes smoke evolved off parts during cleaning. Smoke is mixed with excess air and raised to 1500°F for minimum of 1 second in secondary chamber to completely consume it before venting outdoors.

Gas train to burners contains approved low and high gas pressure switches and electric main gas safety shut-off valve for maximum protection.

Gas burner supplies heat at 800-900°F to safely decompose plastic residues to pyrolysis smoke and gases. Combustion gases from this burner furnishes a partially-inert, low-oxygen furnace atmosphere.

NEW PATENTED LOW-COST TECHNOLOGY . . .

- Makes these cleaning furnaces much less expensive than cleaning systems based on alternative technologies such as fluidized bed or vacuum/heat systems.
- Pollution control of the smoke is built into the furnace and is an integral part of the furnace design.
- Units are completely assembled and tested at the factory before shipment and are easy to install and operate.

SPECIFICATIONS AND DATA

CABINET: Heavy-gauge sheet steel supported by structural steel angles and channels. All-welded construction with sealed seams to prevent air leakage gives maximum fuel economy and safety.

FLOOR: Hard castable refractory, 3-in. thick, reinforced with structural steel channels.

DOOR: Equipped with cam-type lock assemblies, tad-pole sealing gaskets, and stay-open hooks. Door opens slightly over 90°. Door switch ensures door is open during timed purge before burners are ignited for each cleaning cycle.

EXPLOSION RELIEF: Required on all furnaces and ovens. Unique gravity-sealed top relief door(s) automatically opens to relieve excess pressure, then closes, preventing air from reaching combustible material. Conventional spring-latched front doors or blow-out panels used for explosion relief do not provide this important safety feature because, once opened, such doors or panels do not close to keep out air, and material inside will burn freely.

INSULATION: Walls, ceilings, and door are covered with 3-in. of a two-layered ceramic fiber blanket insulation anchored on stainless steel pins, stainless wire mesh, and stainless locking washers. Contains no asbestos. Ceramic fiber insulation makes these furnaces much lighter in weight when compared to firebrick and much faster to heat with less fuel. Special outer sheet metal panels with air insulating construction reduce the outer wall temperatures to a minimum.

VENT STACK: Made in 3 foot long, light-weight sections for easy erection. Stainless steel metal exterior lined with high-temperature ceramic fiber in hard form. Sections snap together. Nine feet of stack furnished with each furnace along with adjustable-pitch roof flashing, storm collar, and rain cap.

FUELS: Natural gas, propane, or #2 fuel oil. Minimum input 250,000 btu/hr to maximum 350,000 btu/hr. Gas pressure required 7 inches water column (0.18 meter). Gas train equipped with approved low and high gas pressure switches, electric main safety shut-off valve, and test cock.

ELECTRIC SERVICE: 110-125 volts, 50-60 hertz, single phase, 7 ampere draw. Optional transformers available for other voltages.

WATER SUPPLY: Minimum pressure 40 psi (2 atmos.); maximum 100 psi (6 atmos.) for water mist injection system. Minimum flow rate 0.15 gpm (0.6 liter/min) to 0.3 gpm (1.2 liter/min). Water spray injection is intermittent, on demand from the temperature controllers, not continuous.

NORMAL CLEANING TIME: Typically 2-4 hours plus cooling time. Actual cleaning times vary with the amount of metal and polymer loaded to the furnace. Timer adjustable 0 to 12 hours.

NORMAL CLEANING TEMPERATURES: 800-900°F (427-482°C). Two dual-set point temperature controllers, range 0-2000°F (-18°C to 1093°C) with Fahrenheit and Celsius scales.

POLLUTION STANDARDS: Meets latest EPA Federal Standards for Incinerators.

SAFETY AND HEALTH STANDARDS: Meets latest O.S.H.A. Federal Standards.

INSURANCE STANDARDS: Meets most state and local codes.

MODEL NUMBER	CLEANING CHAMBER DIMENSIONS						EXTERIOR DIMENSIONS								APPROXIMATE SHIPPING WEIGHT	
											HEIGHT					
	DEPTH		WIDTH		HEIGHT		DEPTH		WIDTH*		AT FRONT		AT REAR			
	IN.	M.	IN.	M.	IN.	M.	IN.	M.	IN.	M.	IN.	M.	IN.	M.	LBS.	KGS.
SCTR-6	72	1.83	18	0.46	10	0.25	94	2.39	35	0.89	58	1.47	88	2.23	3275	1488
SCTR-9	108	2.74	18	0.46	10	0.25	130	3.30	35	0.89	58	1.47	88	2.23	3900	1772
SCTR-12	144	3.66	18	0.46	10	0.25	166	4.22	35	0.89	58	1.47	88	2.23	4500	2045
SCTR-15	180	4.57	18	0.46	10	0.25	202	5.13	35	0.89	58	1.47	88	2.23	5120	2327

*Control box and piping increases width by an additional 12 inches.

POLYMER BURN RATE APPROX 15 POUNDS/HR. MAX.

POLLUTION CONTROL PRODUCTS CO.

FACTORIES

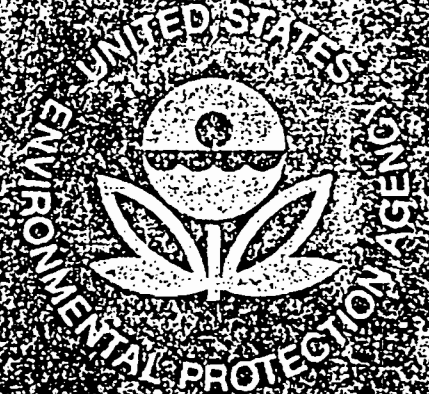
USA
2677 Freewood Drive
Dallas, Texas 75220
214/358-1539
Telex 709610

ENGLAND
79 Whyteleafe Road
Caterham, Surrey CR3 5EJ
(0342) 834659
Telex 926395

SALES OFFICES IN PRINCIPAL CITIES

AIR POLLUTION ENGINEERING MANUAL

SECOND EDITION



U.S. ENVIRONMENTAL PROTECTION AGENCY

CHAPTER 5

CONTROL EQUIPMENT FOR GASES AND VAPORS

AFTERBURNERS

Afterburners, also called vapor incinerators, are air pollution control devices in which combustion converts the combustible materials in gaseous effluents to carbon dioxide and water. The combustible materials may be gases, vapors, or entrained particulate matter and may contribute opacity, odor, irritants, "fallout" materials, photochemical reactivity, and toxicity to the effluents. In many cases, an afterburner can be designed and operated at an efficiency high enough to eliminate or reduce the opacity, odor, irritants, and fallout and also the photochemically reactive and toxic qualities of the effluent to levels required for compliance with air pollution standards.

The two types of afterburners in use are (1) direct flame and (2) catalytic. Direct-flame afterburners, sometimes called direct-fired afterburners, depend upon flame contact and relatively high temperatures to burn the combustible materials. Catalytic afterburners operate by preheating the contaminated effluent to a predetermined temperature (usually lower than the operating temperature of the direct-flame afterburner) and then promoting further oxidation of the combustibles by bringing them into contact with a catalyst. In Los Angeles County, which has standards for emissions of organic materials (Rule 66), afterburners are essentially all of the direct-flame type.

DIRECT-FLAME AFTERBURNERS

Direct-flame afterburners consist of a refractory-lined chamber (which may vary in cross-sectional size along its length), one or more burners, temperature indicator-controllers, safety equipment, and sometimes heat-recovery equipment such as heat exchangers. Figures 98 through 106 show external views of direct-flame afterburners and illustrate the diversity of shapes and processes that can be vented.

DESIGN PRINCIPLES

An efficient direct-flame afterburner design must provide for (1) contact between the air contaminants and the burner flame, (2) adequate time for the combustion process, (3) sufficiently high temperature in the afterburner for the complete oxidation of the combustibles, and (4) adequate velocities to insure that mixing take place without quenching combustion.

The operation of direct-flame afterburners is relatively simple. The contaminated gases are delivered to the afterburner by an exhaust system. The gases are mixed thoroughly with the burner flames in the upstream part of the unit and then pass through the remaining part of the chamber where the combustion process is completed, prior to being discharged to the atmosphere. Figure 107 shows a sectional view of a typical afterburner.

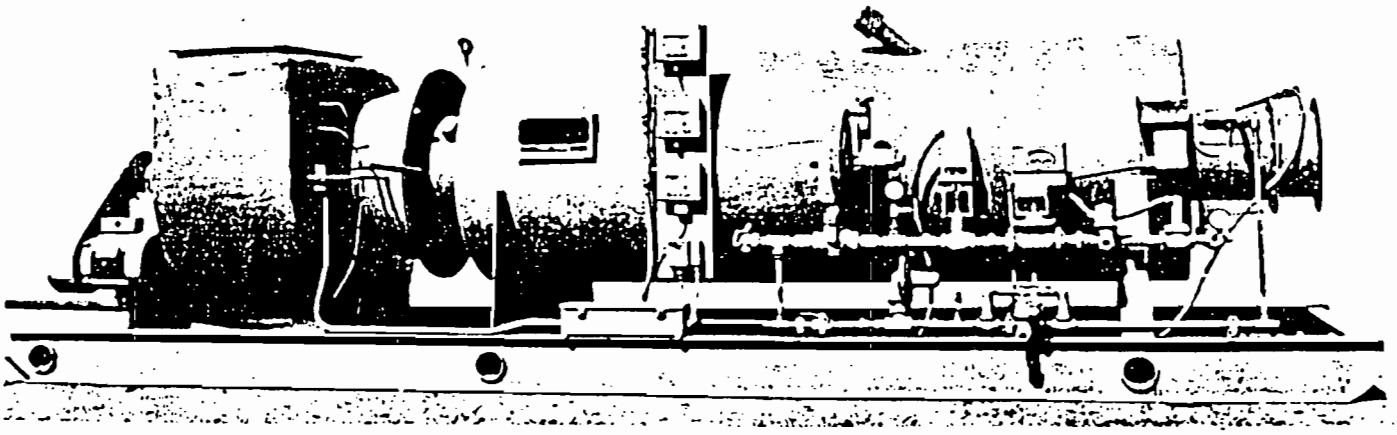


Figure 98. External view of direct-flame afterburner (Gas Processors, Inc., Brea, Calif.).

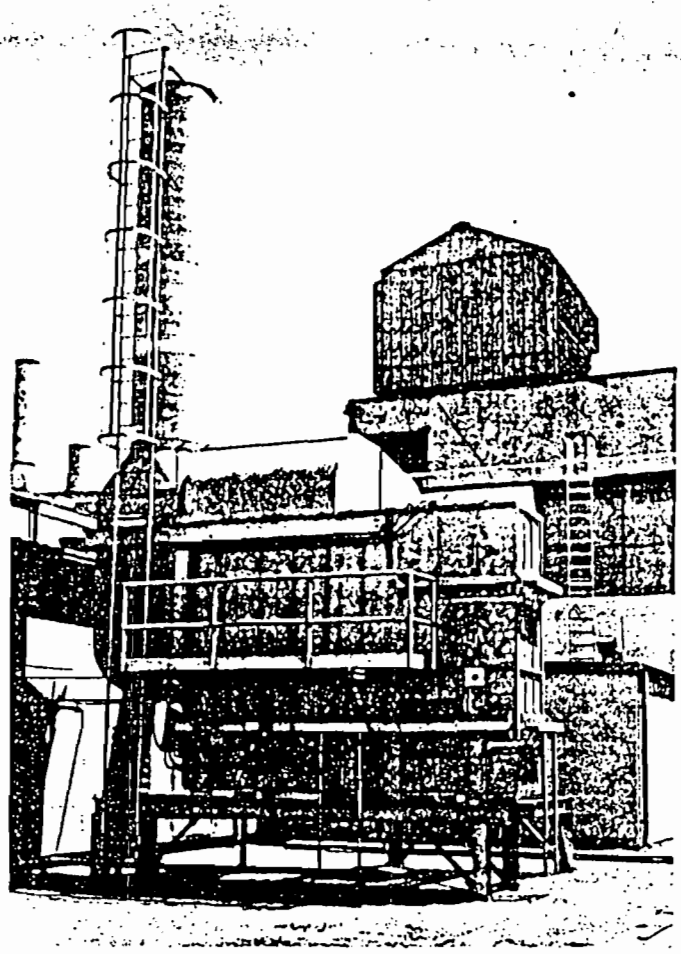


Figure 99. Direct-flame afterburner venting automotive assembly plant oven (GM Assembly Division, General Motors Corporation, Van Nuys, Calif.).

AFTERBURNER CHAMBER

The afterburner chamber may be cylindrical or rectangular in cross section and is constructed of refractory materials inside of a mild-steel shell. The refractory may be fire brick or castable refractory material. The chamber consists of a mixing section and a combustion section. The mixing section must provide for intimate contact between the contaminated gases and the burner flame. This area, therefore, is designed to provide high-velocity flow to insure turbulence and hence good mixing. Usual velocities for this zone vary between 25 and 50 feet per second (fps).

The portion of the chamber downstream of the mixing section is called the combustion chamber, and the velocity in this section is usually 20 to 40 fps. The overall retention time of the gases flowing through the unit should be 0.3 to 0.5 second. Afterburner discharge temperatures range from 1000° to 1500° F, depending upon the particular air pollution problem. Table 51 indicates recommended temperature ranges for various types of equipment. Higher afterburner discharge temperatures than those shown in this table will result in higher afterburner efficiencies.

GAS BURNERS FOR AFTERBURNERS

Among the several types of gas burners used successfully are nozzle-mixing premixing, multi-port, and mixing-plate burners. Nozzle-mixing, premixing, and multi-port burners are described in the burner section of this manual. Mixing-plate burners have been specifically developed for afterburner applications. Figures 108, 109, and 110 show burners of this type. These burners consist of a pipe with orifices for natural gas and vanes or plates, which are perforated or shaped in a variety of ways to give good mixing between a contaminated air stream and the natural gas fuel. Most of the contaminated gases go through the burner.

The choice of burner type and the arrangement of the burners in the afterburner vary widely. The exact method of burner placement depends not only on the burner type, but also on the design consideration that the contaminated gases be in intimate contact with the burner flame. Maximum afterburner efficiency occurs when all of the contaminated material passes through the burner. In contrast, efficiencies are much lower when the contaminated air and burner flame mix far outside the burner. Very low efficiency is associated with minimum flame contact.

Gas burner arrangements, sources of combustion air, and methods for securing flame contact with the contaminated air are discussed below.

Mixing-Plate Burner (Figures 108, 109, and 110)

Mixing-plate burners usually are placed across the inlet section of the afterburner body. All air for combustion of the natural gas originates from the contaminated air stream.

Intimate flame contact is secured by positioning the burners and "profile plates" to force the maximum amount of contaminated air through the burner and burner flames. Profile plates, usually made of stainless steel, are installed around the burner between the afterburner walls and the burners. A space of 1 to 2 inches remains between the plate and the burner. The extremely high velocity (200 fpm) ensures that the contaminated air not flowing through the burner will mix with the burner flames.

Multi-Port Burners

Multi-port burners usually are installed across a section of the afterburner separate from the main afterburner chamber. All air for combustion is taken from the contaminated air stream. However, most multi-port burners are not capable of handling all of the contaminated stream through the

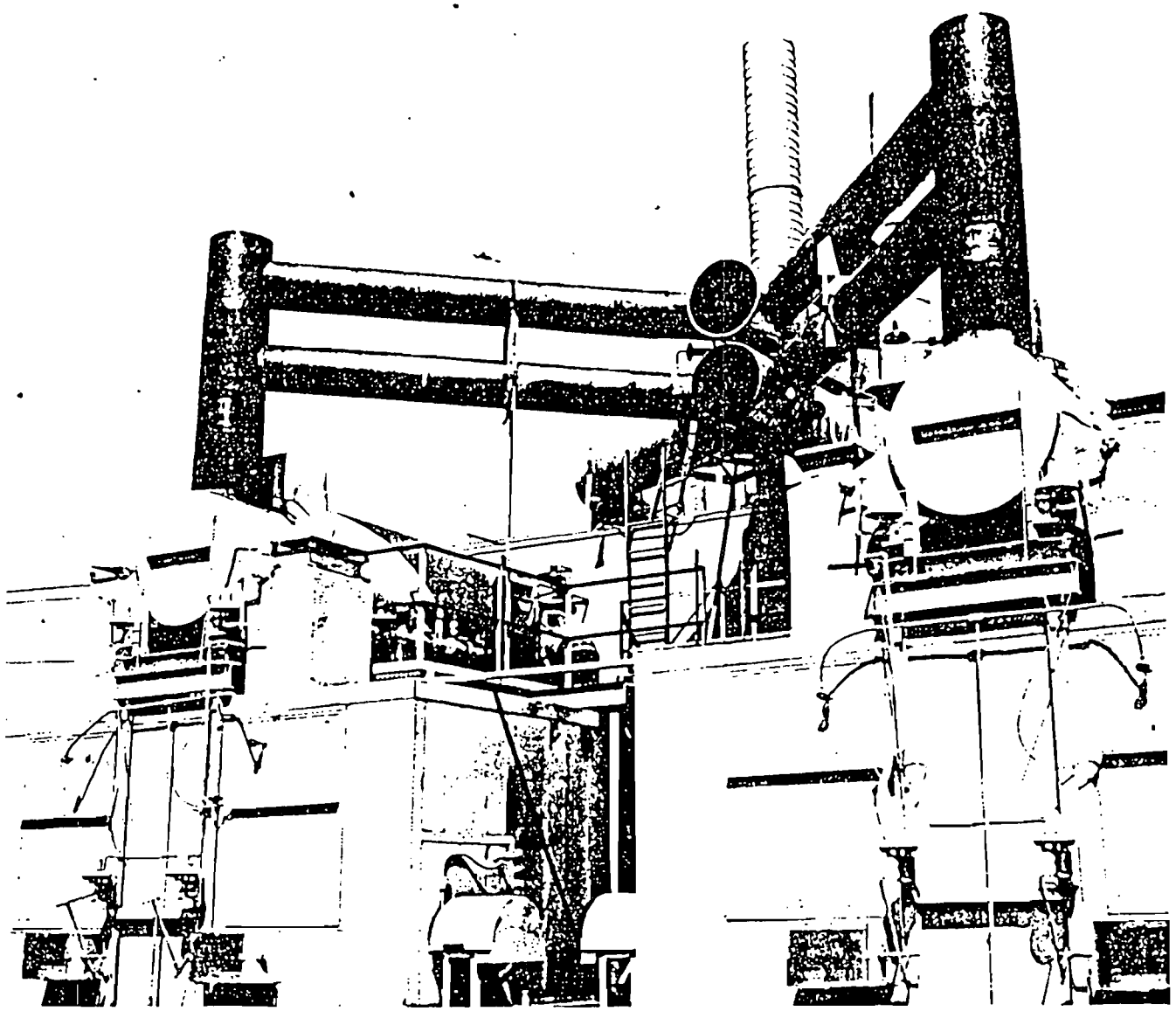


Figure 100. Two direct-flame afterburners controlling venting of organic emissions (American Cyanamid Co., Azusa, Calif.).

burner. Therefore, some of the air must be by-passed around the burner and then thoroughly mixed downstream with burner flames in a restricted and baffled area. For this reason, afterburners with multi-port burners may not be as efficient as units with mixing-plate burners. Efficiency of afterburners with multi-port burners will be influenced by the amount of contaminants that by-pass the burner.

Nozzle Mixing and Premixing Burners

The operation of these two types of burners is somewhat similar. They are arranged to fire tangentially into a cylindrical afterburner. Several burners or nozzles are required to ensure complete flame coverage. In addition, multiple nozzles may be arranged to fire along the length of the afterburner. Air for combustion of the fuel can be taken from outside air or from the contaminated air stream.

Mixing between the contaminated gases and the burner flame is achieved in a smaller cross-sectional area of the afterburner (called the mixing section). Tangentially fired afterburners may have the contaminated gases introduced tangentially or along the major axis of the cylinder.

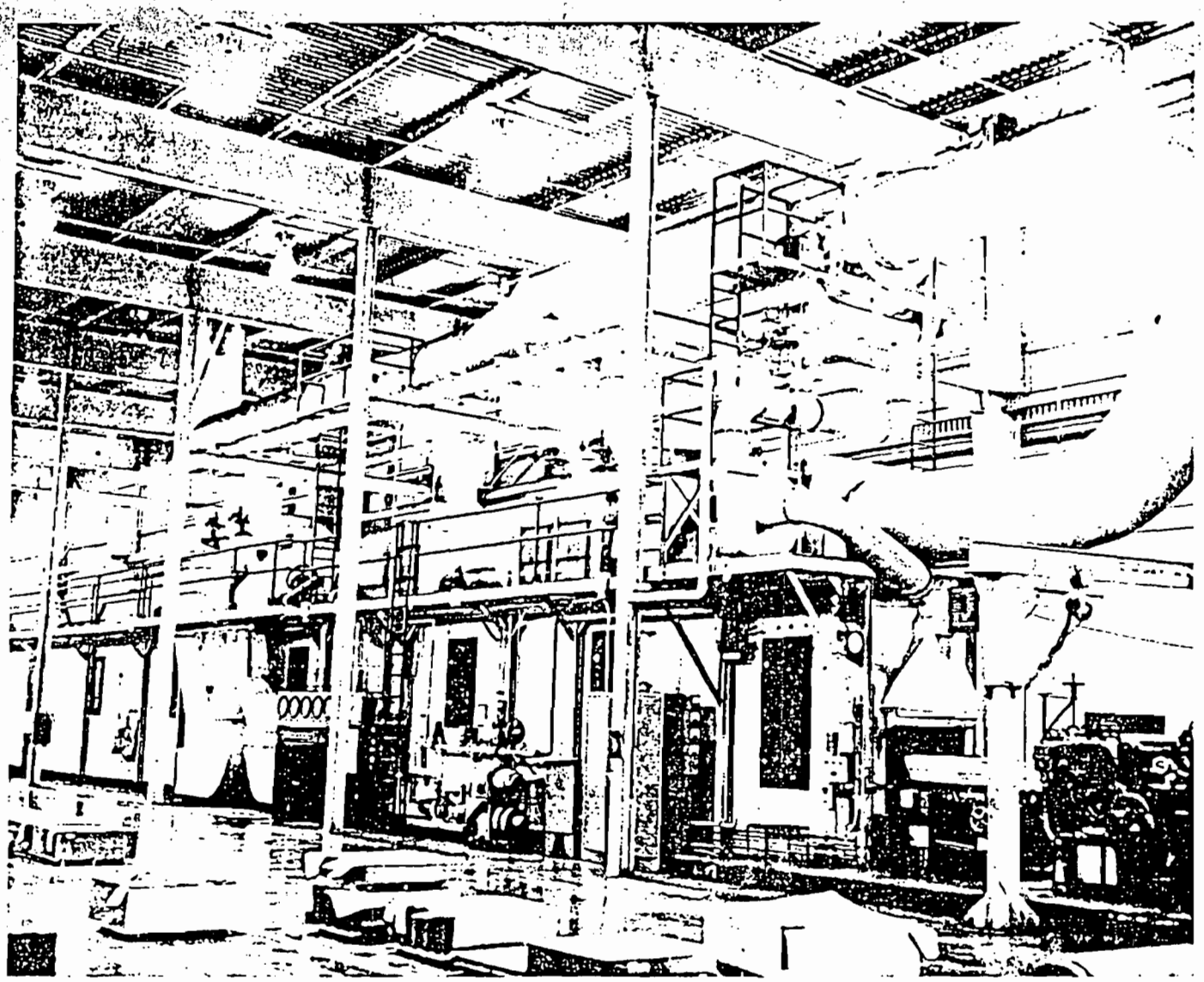


Figure 101. Direct-flame afterburner venting metal sheet lithographing line (American Can Co., Los Angeles, Calif.).

Refractory baffles and orifices also may be required to give the best possible mixing between flame and contaminated gases.

SOURCES OF COMBUSTION AIR FOR GAS BURNERS

As mentioned above, combustion air may be taken from the contaminated air stream or from ambient air. If the contaminated stream contains sufficient oxygen for combustion of the fuel and combustible contaminants, then additional oxygen is not required. Mixing-plate and multi-port burners supply the correct volume of air automatically. Premix and nozzle-mix burners require a blower and air-gas ratio controls to meter the proper mixture and combustion air. The combustion air for these burners comes from the contaminated air stream by branch ducting from the main exhaust duct. Using this contaminated air for combustion results in higher afterburner efficiency and fuel savings of 20 to 30 percent.

OIL FIRING OF AFTERBURNERS

Oil firing of afterburners is feasible provided that proper design practice is followed and good flame contact is assured. Although oil firing is possible, it may be undesirable from the standpoint of overall air pollution emissions. The combustion of oil produces oxides of sulfur from the sulfur-containing oil and may produce oxides of nitrogen greater than those from gas-fired units. For these reasons, oil firing may not be desirable for many locales or should be restricted, i.e., used only for periods when fuel gas is not available.

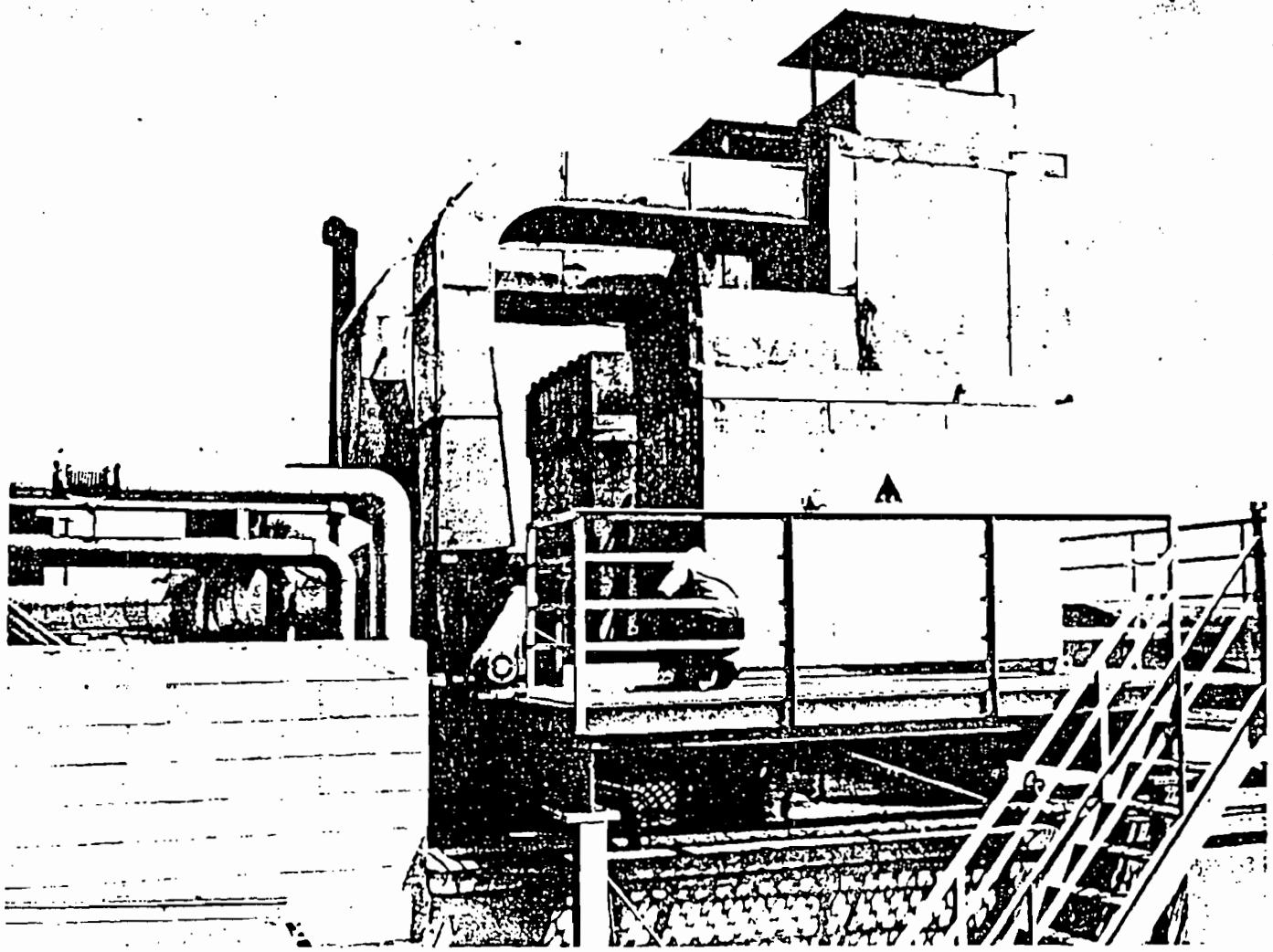


Figure 102. Direct-flame afterburner venting resin impregnating line (Synthane-Taylor Corporation, LaVerne, Calif.).

AFTERBURNER CONTROLS

Afterburner operating controls usually consist of a shielded thermocouple located in the discharge of the afterburner and an indicating-controlling pyrometer, which is coupled to the thermocouple. The pyrometer electrically or pneumatically controls gas and combustion air valves to modulate the amount of fuel fed to the afterburner. The mode of operation is fully modulating or high-low. The on-off control mode is undesirable since there are substantial periods when no burner flame is present with accompanying very low afterburner efficiency.

Safety controls consists of (1) flame safety devices to prove the presence of pilot burner flame, (2) timing devices to ensure that the afterburner is purged of combustibles before burner ignition, (3) high-temperature-limit controls to limit the afterburner temperature to a safe limit, and (4) pressure switches to detect low gas and air pressures and shut down the unit if pressures become too low.

DIRECT-FLAME AFTERBURNER EFFICIENCY

Afterburner efficiency is defined as:

$$\text{Efficiency } (\%) = \frac{(\text{lb contam/hr in}) - (\text{lb contam/hr out})}{\text{lb contaminant/hr in}} \times 100$$

As mentioned earlier, the efficiency of an afterburner is a function of retention time, operating temperature, flame contact, and velocity. There is no quantitative mathematical relationship that relates efficiency to these variables because the kinetics of the combustion process are complex and the flow in afterburners is not easily defined. Assuming good design, the following generalizations may be made with respect to afterburner efficiency:

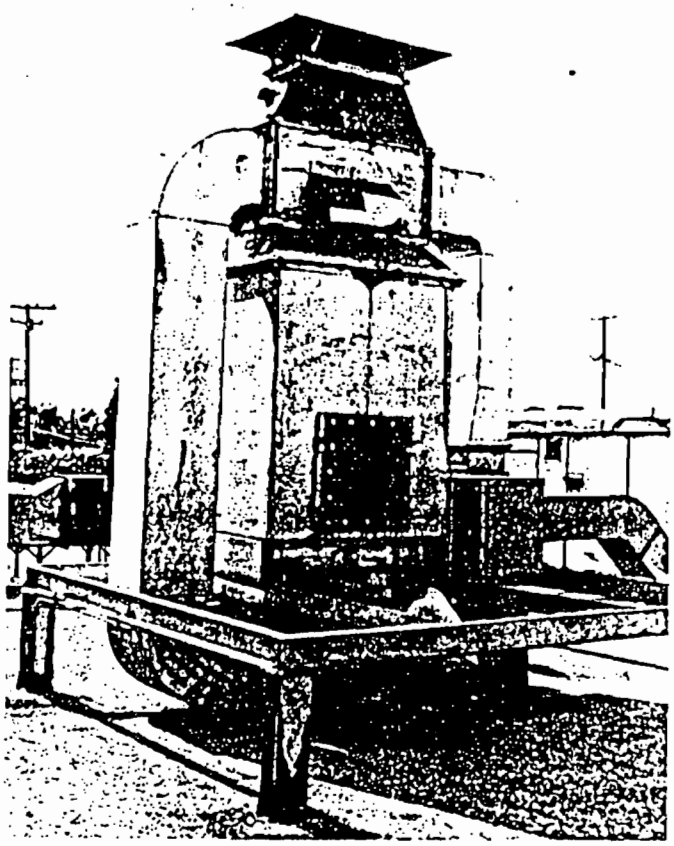


Figure 103. Direct-flame afterburner venting printing system (Avery Label Company, Div. of Avery Products Corporation; Monrovia, Calif.).

1. Overall efficiency increases with increasing afterburner operating temperature. Figure 111 illustrates this point.

2. Overall efficiency decreases if excessive preheat is given to the contaminated gases entering the afterburner.

3. Overall efficiency increases with increased flame contact between the contaminated gases and the burner flame.

4. Efficiency increases with retention time for retention times of less than 1 second.

5. Efficiency is a function of the afterburner design, and the inlet concentration of organic materials. No direct comparison can be made from one design to another.

6. An afterburner rarely attains 90 percent efficiency below 1300° F if the generation of carbon monoxide in the afterburner is included.

Tables 52 and 53 show typical data from tests on a large and a small afterburner.

In moderately efficient afterburners organic materials frequently decrease across the afterburner, but carbon monoxide levels increase. While this indicates some oxidation of organic materials, the materials discharged from the afterburner may be considerably more photochemically reactive, odorous, or irritating than the organic materials entering the afterburner. Thus, there may not be an overall improvement in the environment. In addition, the venting of carbon monoxide to the atmosphere is undesirable.

DIRECT-FLAME AFTERBURNER DESIGN PROBLEM

Given:

Source of air contaminants - paint bake oven

Oven effluent air volume - 4000 scfm

Contaminated air temperature at afterburner inlet - 300° F

Concentration of solvent - 300 ppm

Required afterburner efficiency - 90%

Problem:

Determine dimensions of afterburner, burner type, operating temperature, and required natural gas input.

1. Burner selection:

   The afterburner inlet gases will be relatively low in concentration (300 ppm). In addition, 90 percent efficiency based on carbon is required by Rule 66, which demands the best flame contact possible. On these bases, select a mixing plate burner.

2. Temperature selection:

   The 90 percent efficiency requirement dictates the choice of 1400° F as the minimum required operating temperature.

3. Burner capacity:

   a. Net heat required to raise contaminate air stream to 1400° F from 300° F

      Assumed properties of air:

      Enthalpy at 1400° F = 26.13 Btu/scf (see Table D4 in Appendix D)

      Enthalpy at 300 °F = 4.42 Btu/scf (See Table D-4 in Appendix D)

      Net enthalpy = 21.71 Btu/scf

      $Q_{net} = (4000)(60)(21.71) = 5.2 \times 10^6$ Btu/hr

   b. Natural gas input required:

      The hypothetical available heat for natural gas with 0% outside primary

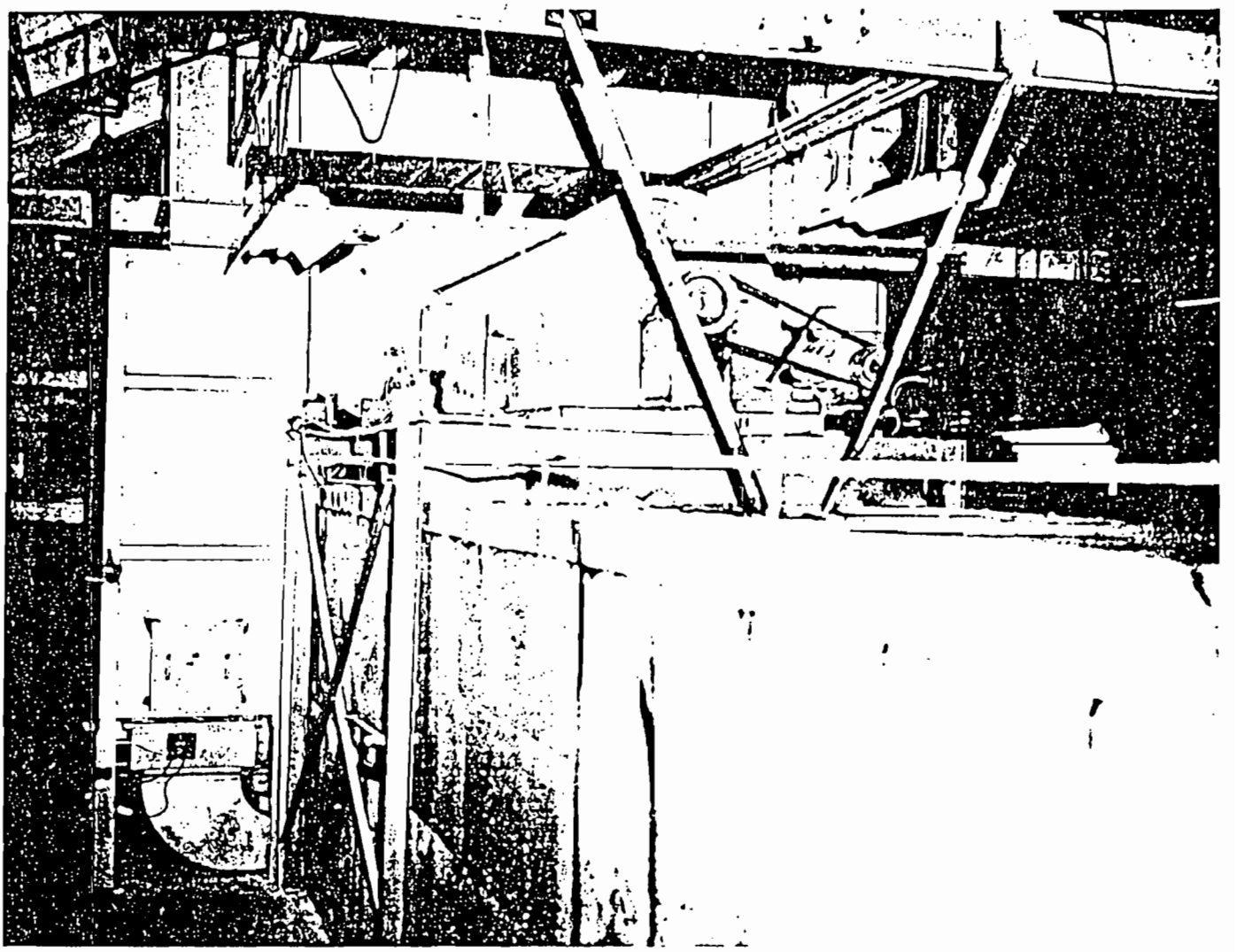


Figure 104. Direct-flame afterburner venting paint baking oven (Weber Show Case and Fixture, Div. of Walter Kidde and Company, Inc., Los Angeles, Calif.).

air = 939 Btu/ft^3 (see Table C1 in Appendix C)

Natural gas input =

$$\frac{Q_{net}}{\text{Hypothetical available heat}} =$$

$$\frac{5.2 \times 10^6}{939} = 5,550 \text{ ft}^3/\text{hr}$$

4. Combustion chamber diameter:

Chamber is assumed to be cylindrical

a. Volume of gases in afterburner:

Vol = Oven effluent air + effluent used for combustion products from combustion of natural gas.

(1) Air for combustion of natural gas in (3b) above:

Air required = 10.36 ft^3/ft^3 natural gas (see Table D7 in Appendix D)

$$\frac{(5,550)\ (10.36)}{60} = 959 \text{ scfm}$$

(2) Products from combustion of natural gas:

Combustion products = 11.45 scfm/ft^3 natural gas (see Table D7 in Appendix D)

$$\frac{(5,550)\ (11.45)}{60} = 1060 \text{ scfm}$$

(3) Volume of gases in afterburner:

4000 + 959 + 1060 = 6019 scfm

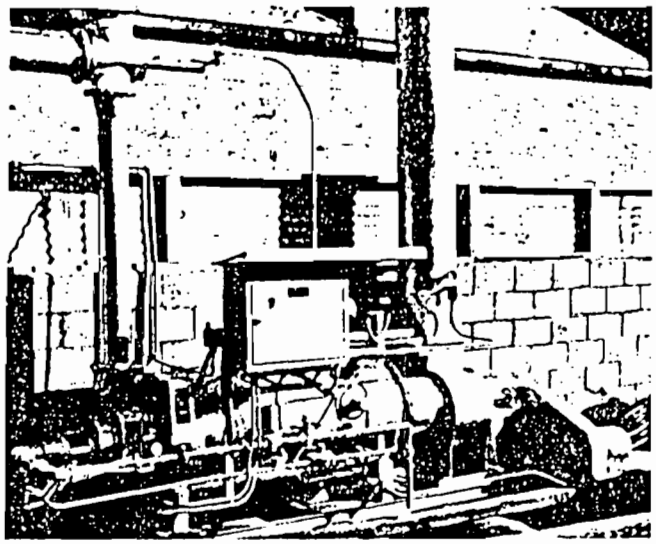


Figure 105. Direct-flame afterburner venting three varnish cooking kettles and a thinning station (National Paint and Varnish Co., Los Angeles, Calif.).

(4) Volume of gases at 1400° F (1,860° R):

$$\frac{(4100)\ (1860)}{(60)\ (520)} = 244 \text{ cfs}$$

b. Diameter of afterburner:

Velocities of 20 to 40 fps are satisfactory.

Assume 30 fps.

Afterburner cross section = (244) (1/30) = 8.1 ft^2

Diameter corresponding to 8.1 ft^2 =

$$\sqrt{\frac{8.1}{0.785}} = 3.2 \text{ ft}$$

5. Combustion chamber length:

Retention times of 0.3 to 0.5 second are adequate.

Assume 0.5 second.

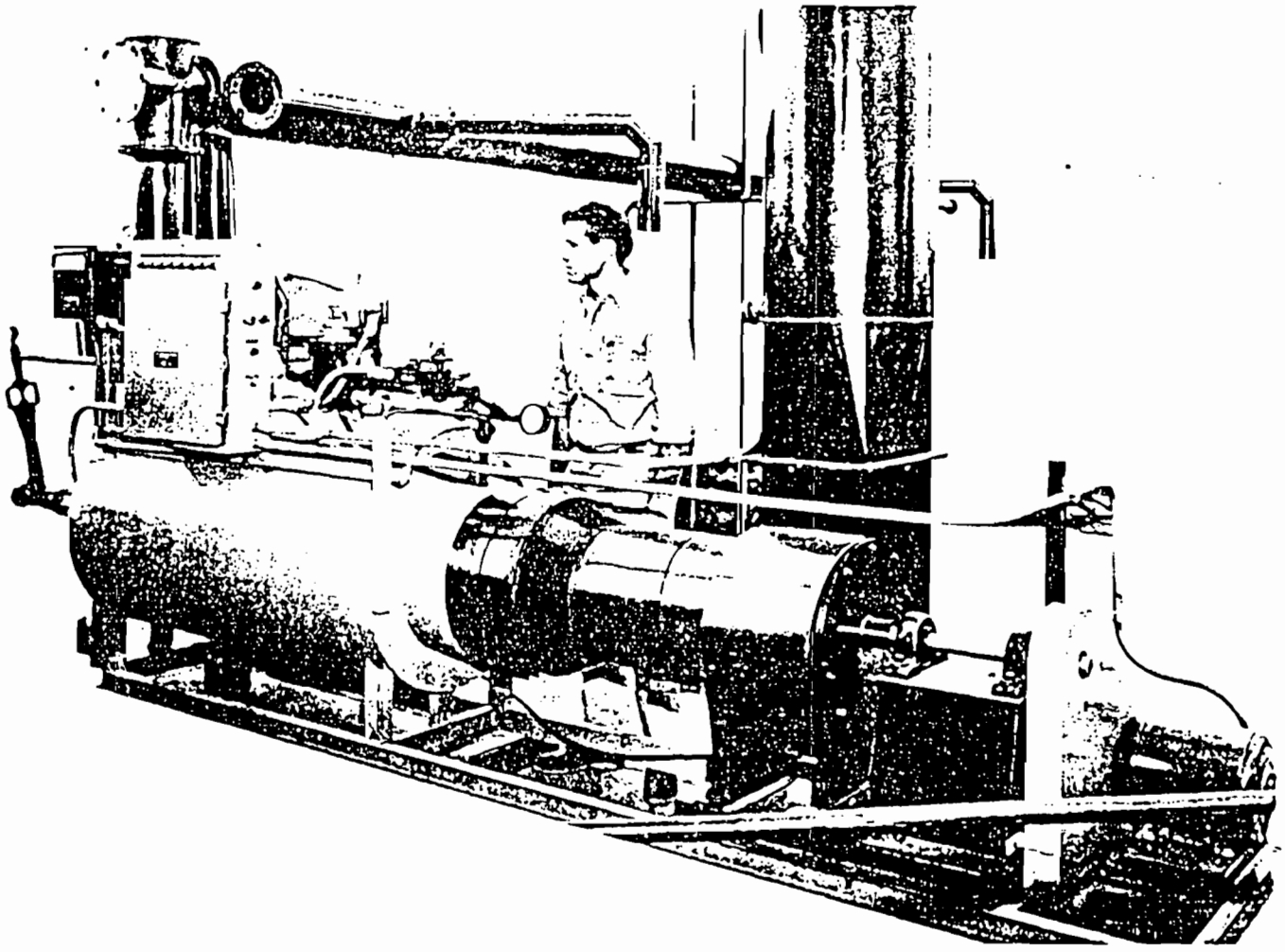


Figure 106. Direct-flame afterburner with induced-draft fan, all mounted on an integral frame and ready for shipment (Hirt Combustion Engineers, Montebello, Calif.).

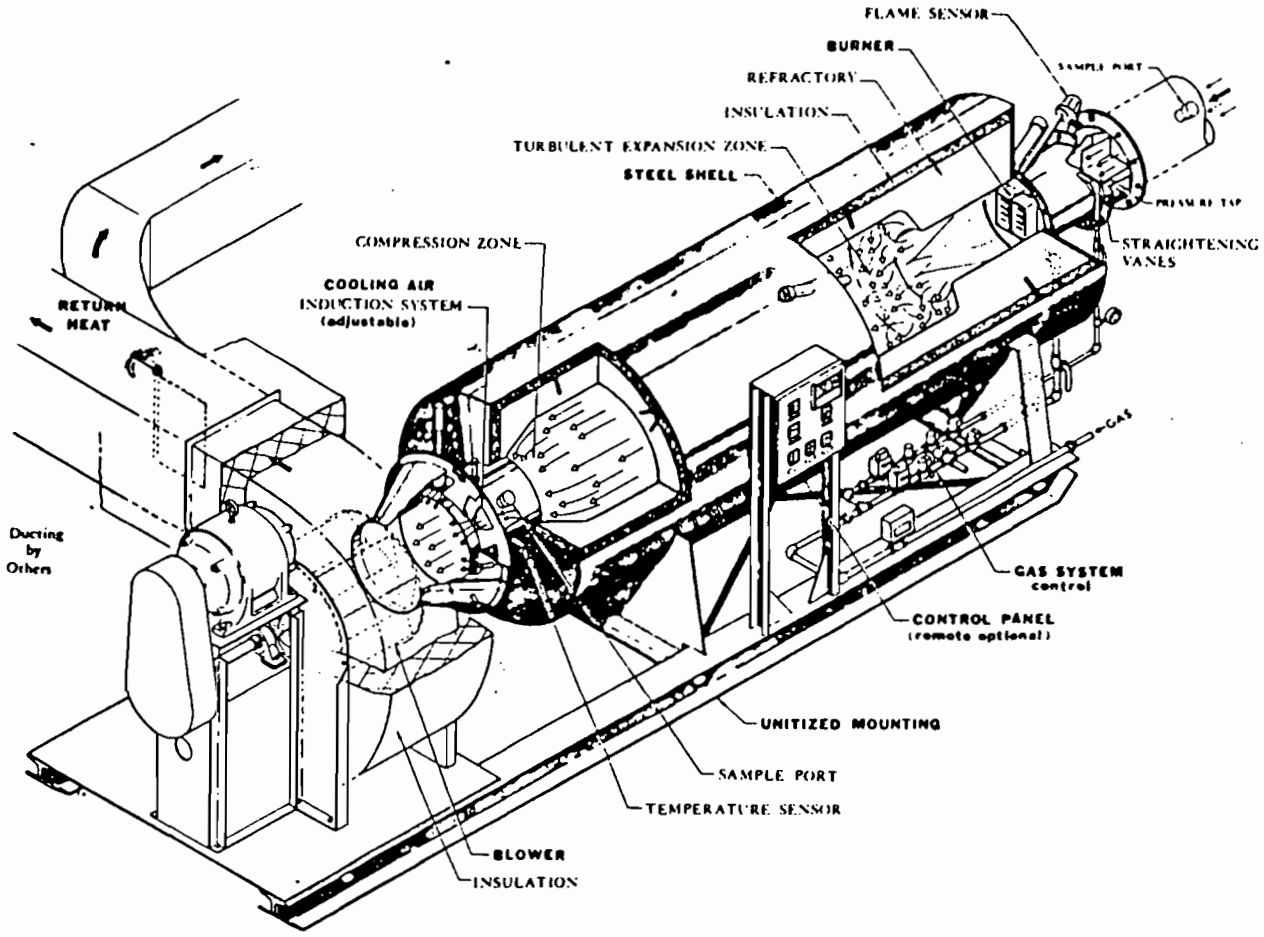


Figure 107. Sectional view of direct-flame afterburner (Gas Processors, Inc., Brea, Calif.).

Table 51. RECOMMENDED AFTERBURNER OPERATING TEMPERATURES

Operation	Recommended temperature, ° F
Carpet laminating	1200 - 1400
Core oven	1400
Cloth carbonization	1800
Deep fat fryers	1200
General opacity problems	1200 - 1400
Odor control	1300 - 1500
Oil and grease smoke	1200 - 1400
Paint bake ovens	1200 - 1500
Pipe wrapping	1400
Rendering operations	1200
Smokehouse	1200
Solvent control	1300 - 1500
Varnish cookers	1200
Vinyl plastisol curing	1200 - 1400

Length = (retention time) (velocity)

= (0.5)(30) = 15 ft

Summary of design:

Burner type--Mixing plate

Afterburner temperature = 1400° F

Burner input = 5,550 cfh

Afterburner diameter = 3.2 ft

Afterburner chamber length = 15 ft

CATALYTIC AFTERBURNERS

A catalytic afterburner consists of a preheat burner section, a chamber containing catalyst, temperature indicator-controllers, safety equipment, and heat recovery equipment. Figures 112 through 115 show various arrangements of catalytic afterburners.

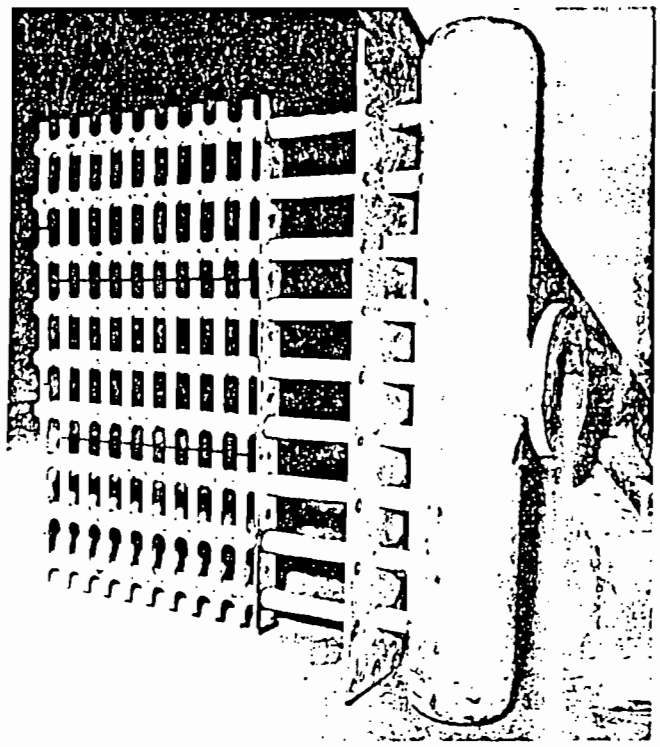


Figure 108. Mixing plate burner (J.T. Thorpe Inc., Los Angeles, Calif.).

OPERATION

A catalyst is a substance that changes the rate of a chemical reaction and does not appear to change chemically in doing so. In the case of afterburners, the catalyst functions to promote the oxidation reactions at a somewhat lower temperature than occurs in a direct-flame afterburner. The catalyst usually is platinum combined with other metals and deposited in porous form on an inert substrate. The substrate may be in the form of rods, honeycomb, or ribbons. In any case, the objective is to present the maximum catalyst surface area to the contaminated gases.

In operation, the contaminated gases delivered to the afterburner first enter the preheat zone, where they are heated to the temperature required to sustain the catalytic combustion. The preheat zone temperature varies with the composition and type of contaminants to be oxidized, but is generally in the range of 650° to 1100° F. A substantial portion of the overall efficiency of the afterburner can be attributed to the burner in the preheated zone. The preheated gases then flow through the catalytic elements, where the remaining contaminants are burned. The combustion reaction is exothermic, resulting in an increase of catalyst temperature--the greater the concentration of

Figure 109. Mixing plate burner (Maxon Premix Burner Co., Inc., Muncie, Ind.).

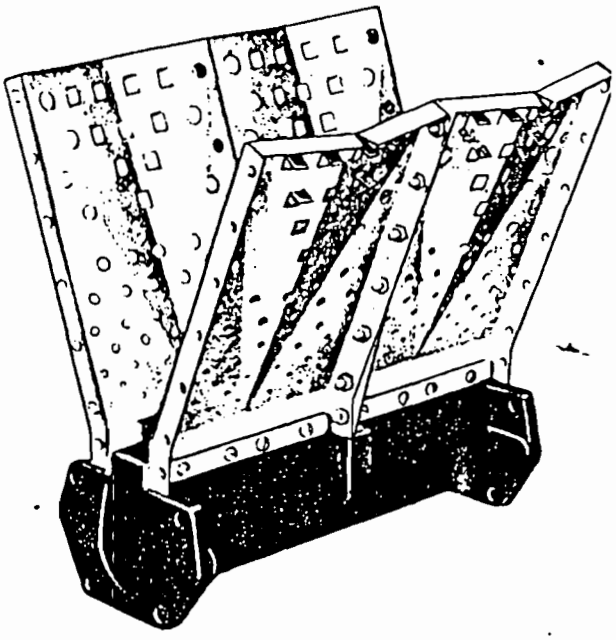


Figure 110. Schematic drawing of mixing plate burner (Maxon Primix Burner Co., Inc., Muncie, Inc.).

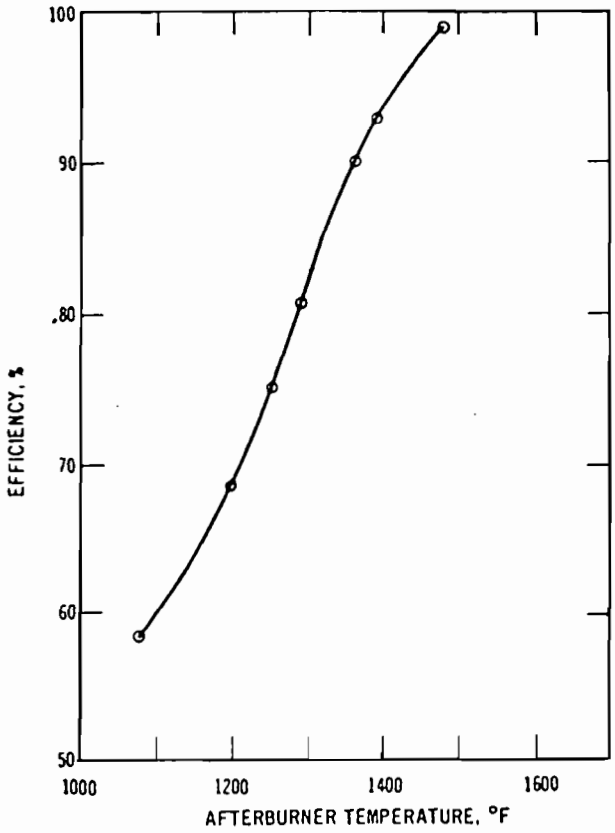


Figure 111. Direct-flame afterburner efficiency as a function of temperature.

combustible material, the higher the catalyst temperature. Under some conditions it is possible to reduce the preheat temperature of the entering gases after the reaction has been initiated.

EFFICIENCY

The efficiency of catalytic afterburners is a function of many variables. These include surface area of the catalyst, catalyst type, uniformity of flow of the gases through the catalyst bed, nature of the material being burned, oxygen concentration, volume of gases per unit of catalyst, and temperature of the unit.

The efficiency of a catalytic afterburner deteriorates as the unit is used, and periodic replacement of the elements is required. This replacement time varies widely, depending upon the service of the unit, from a few months to 2 years. In addition, the performance of the catalyst is seriously affected by materials that "poison" the catalyst. Some of these are mercury, arsenic, zinc, and lead. Substances that coat the catalytic elements such as resin solids and solid oxides must be avoided since these materials will seal off the catalyst from the gases to be treated.

Catalytic afterburners may not be capable of meeting local efficiency requirements, such as 90 percent conversion of the carbon in the organic materials to carbon dioxide. New catalysts recently made available may increase the afterburner efficiency at relatively high inlet concentrations (greater than 5000 ppm as carbon). At lower concentrations, the catalytic afterburner efficiency decreases markedly even at discharge temperatures as high as 1100° F. Catalytic afterburners operating at less than 900° to 1000° F may exhaust gases that are odorous and eye irritating. This problem appears to be due to the incomplete oxidation of the organic material, resulting in aldehydes, ketones, and organic acids.

RECOVERY OF HEAT FROM AFTERBURNER EXHAUST GASES

The heat discharge in the afterburner exhaust gases frequently can be recovered, and thus the overall cost of afterburner operation may be reduced. Some of the heat recovery schemes that have been used successfully include:

1. Heat exchangers to heat the contaminated gases before entry into the afterburner.

Table 52. TYPICAL ANALYSIS OF EMISSIONS ENTERING AND LEAVING LARGE DIRECT-FIRED AFTERBURNER

	Temperature			
	1400° F		1500° F	
	In	Out	In	Out
CO_2, ppm	6,300	22,000	6,600	27,000
CO, ppm	59	230	65	21
Organics as CO_2, ppm	1,568	235[a]	1,591	70
Volume (dry basis), scfm	11,950	11,800	12,000	11,800
Organics (as carbon), lb/hr	35.6	5.26	36.2	1.6
Afterburner efficiency, %	85		96	

[a]Includes increase of CO across afterburner.

Table 53. TYPICAL ANALYSIS OF EMISSIONS ENTERING AND LEAVING SMALL DIRECT-FIRED AFTERBURNER

	Temperature			
	1300° F		1400° F	
	In	Out	In	Out
CO_2, ppm	1,950	19,000	2,000	23,500
CO, ppm	8	110	9	24
Organics as CO_2, ppm	521	122[a]	408	33[a]
Volume (dry basis), scfm	2,240	2,200	2,240	2,200
Organics (as carbon), lb/hr	2.21	0.50	1.74	0.14
Afterburner efficiency, %	77		92	

[a]Includes increase of CO across afterburner.

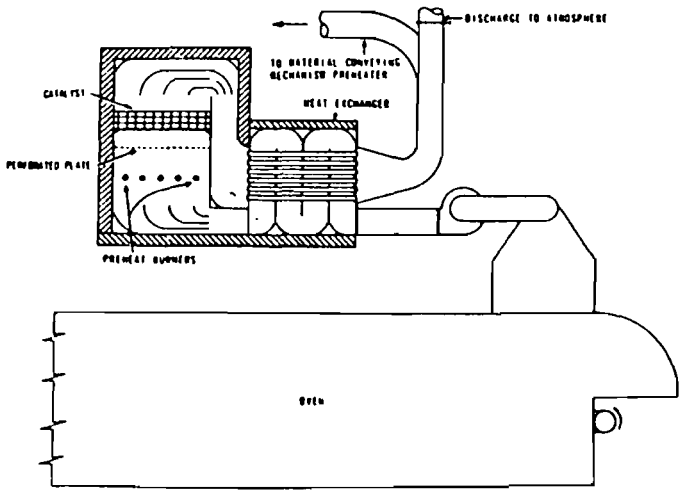


Figure 112. Typical catalytic afterburner utilizing indirect heat recovery.

2. Heat exchangers to heat air as a source of heat for the equipment generating the contaminated gases.

3. Venting of the afterburner gases to other process equipment such as waste heat boilers, water dry-off ovens, and vaporizers.

PREHEATING OF AFTERBURNER INLET GASES

Use of a heat exchanger for preheating the contaminated gases entering the afterburner is one of the most commonly used methods of recovery of heat from afterburner exhaust gases. The usual method is to use a shell-and-tube heat exchanger with the gases to be heated on the tube side and the afterburner discharge gases on the shell side. There may be one or two passes on the tube side and one pass on the shell side. In heat exchange

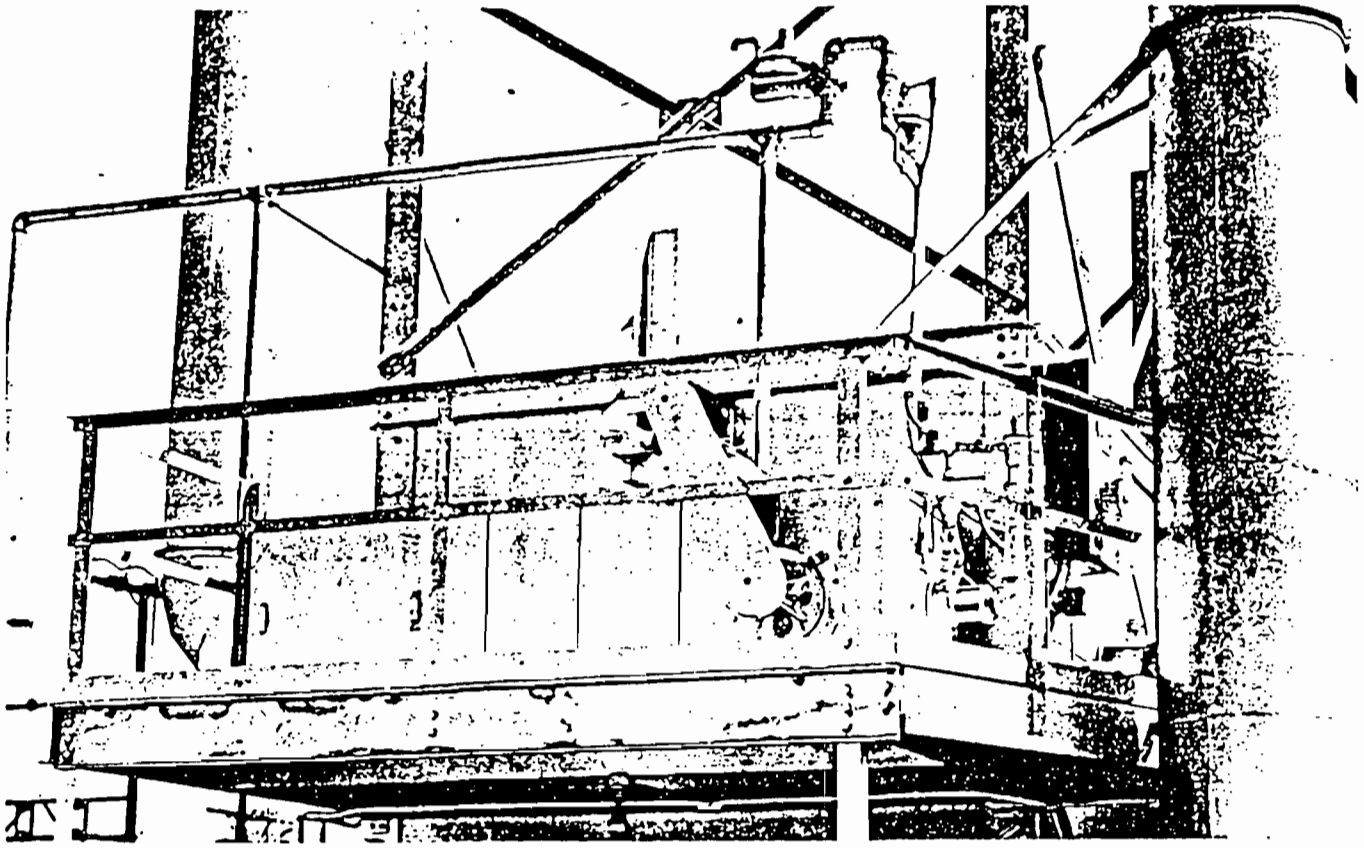


Figure 113. A catalytic afterburner used to control a foundry core baking oven (Catalytic Combustion Corporation, Detroit, Michigan).

terminology, a pass is the number of times an individual stream exchanges heat with another stream. The temperature of the heated, contaminated gas leaving the exchanger usually is about midway between the cool gases entering the exchanger and the temperature of the gases vented to the exchanger from the afterburner.

The stream entering the afterburner should not be preheated to too high a temperature. Excessive preheat will substantially reduce the amount of burner flame present and thus lower the efficiency.

BOILERS USED AS AFTERBURNERS

Fireboxes of boilers and fired heaters can be used, under proper conditions, as afterburners to incinerate combustible air contaminants. This use is unique in that a basic source of air contaminants, a boiler, is used to control pollutants from another source. Boiler firebox conditions approximate those of a well-designed afterburner, provided there are adequate temperature, retention time, turbulence, and flame. Oxidizable contaminants, including smoke and organic vapors and gases, can be converted essentially to carbon dioxide and water in boiler fireboxes.

The discussion of this section is limited to the control of low-calorific-value gases and vapors with common types of steam and hot water boilers and heaters. When appreciable heat is contained in the contaminated gases, the firebox is usually of special design to take advantage of the heat potential. These latter units, commonly known as waste heat boilers, are discussed in Chapter 9.

Completely satisfactory adaptations of boilers for use as afterburners are not common. All aspects of operation should be thoroughly evaluated before this method of air pollution control is used. The primary function of a boiler is to supply steam or hot water, and whenever its use as a control device conflicts with this function, one or both of its purposes will suffer. Some advantages and disadvantages of boilers used as afterburners are shown in Table 54.

CONDITIONS FOR USE

The determination to use a boiler as an afterburner demands that the following conditions exist:

1. The air contaminants to be controlled must be almost wholly combustible since a boiler