Check Sheet

Company Name: Kennedy Space Center
Permit Number: AC 05-195652
PSD Number:
Permit Engineer:

Application:

- [x] Initial Application
  - [ ] Incompleteness Letters
  - [ ] Responses
  - [ ] Waiver of Department Action
  - [ ] Department Response
  - [ ] Other

Cross References:

- [ ]
- [ ]
- [ ]

Intent:

- [x] Intent to Issue
- [x] Notice of Intent to Issue
- [x] Technical Evaluation
- [ ] BACT Determination
- [x] Unsigned Permit

Correspondence with:

- [ ] EPA
- [ ] Park Services
- [ ] Other

- [x] Proof of Publication
  - [ ] Petitions - (Related to extensions, hearings, etc.)
  - [x] Waiver of Department Action
  - [ ] Other

Final Determination:

- [x] Final Determination
- [x] Signed Permit
- [ ] BACT Determination
  - [ ] Other

Post Permit Correspondence:

- [ ] Extensions/Amendments/Modifications
- [ ] Other

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

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

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

Consult postmaster for fee.

3. Article Addressed to:

Mr. Walter D. Murphy
Director of Engineering
John F. Kennedy Space Ctr
NASA
Kennedy Space Center, Fl
32899

4a. Article Number
P 617 884 187

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

7. Date of Delivery
11-4-91

5. Signature (Addressee)

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

6. ~~Signature~~ (Agent)

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

P 617 884 187

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

UNITED STATES POSTAL SERVICE

Sent to	Walter D. Murphy
Street & No.	NASA
P.O., State & ZIP Code	Kennedy Space Ctr, Fl
Postage	
Certified Fee	$
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date	11-1-91

PS Form **3800**, June 1990

RC 05-195652

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT

In the matter of an
Application for Permit by:

DER File No. AC 05-195652
Brevard County

Mr. Walter T. Murphy
Director of Engineering Development
John F. Kennedy Space Center
National Aeronautics & Space Administration
Kennedy Space Center, Florida 32899

_____/

Enclosed is Permit Number AC 05-195652 to construct an exhaust system for the cable fabrication/etching process at the Kennedy Space Center in Brevard County, Florida, issued pursuant to Section(s) 403, Florida Statutes.

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

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

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

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of business on 11-1-91 to the listed persons.

Clerk Stamp

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

(Clerk) 11-1-91 (Date)

Copies furnished to:
C. Collins, Central Dist.
D. Buff, P.E.

Final Determination

National Aeronautics and Space Administration
Brevard County
Kennedy Space Center, Florida

Exhaust System for Cable Fabrication/Etching Process
Hangar N

Permit Number: AC 05-195652

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

November 1, 1991

Final Determination

The Technical Evaluation and Preliminary Determination for the permit to construct an exhaust system for the cable fabrication/etching process in Hangar N at the National Aeronautics and Space Administration's facility in Brevard County, Florida, was distributed on June 4, 1991. The Notice of Intent to Issue was published in Florida Today on July 31, 1991. Copies of the evaluation were available for public inspection at the Department's Tallahassee and Orlando offices.

No comments were submitted on the Department's Intent to Issue the permit. The final action of the Department will be to issue construction permit AC 05-195652 as proposed in the Technical Evaluation and Preliminary Determination.

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

PERMITTEE:
National Aeronautics &
Space Administration
Kennedy Space Center, FL
32899

Permit Number: AC 05-195652
Expiration Date: June 30, 1992
County: Brevard
Latitude/Longitude: 28°33'43"N
80°39'36"W
Project: Exhaust System for Cable Fabrication/Etching Process - Hangar N

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 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 drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the construction of an exhaust system for the cable fabrication/etching process in Hangar N, located at 1728 Hanger Road, Kennedy Space Center, Brevard County, Florida.

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

Attachments are listed below:

1. Application received on April 16, 1991.

GENERAL CONDITIONS:

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

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

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

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

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

GENERAL CONDITIONS:

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

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

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

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

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

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

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

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

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

GENERAL CONDITIONS:

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

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

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

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

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

13. The permittee shall comply with the following:

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

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

GENERAL CONDITIONS:

report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

1. The construction and operation of this source shall be in accordance with the capacities and specifications stated in the application.

2. The cable fabrication and etching process shall be allowed to operate for up to 8,760 hours per year.

3. Hydrocarbon emissions (VOC) shall not exceed the following calculated values, and total VOC emissions from the source shall not exceed 18.4 lbs/day (rolling 90-day average) and 3.35 tons/year. Compliance shall be demonstrated by applying the following raw material utilization rates and VOC content factors:

Chemical	Utilization Rate (lbs/yr)	VOC (% by wt.)	VOC Emissions (lbs/yr)
Isopropanol	1,574	100	1,574
Methyl Ethyl Ketone	1,613	100	1,613
Acetone	791	100	791
Toluene	866	100	866

SPECIFIC CONDITIONS:

Xylene	870	100	870
1,1,1-Trichloroethane	528	100	528
PR-420 Brown	87	78	68
PR-1590	854	0	0
Stycast 2651	828	0	0
Catalyst 9	66	0	0
MS-122	402	99	398
Tetra-Etch	243	75	182
TOTAL			6,708

Other materials may be used if prior approval is obtained from the Department and if the total VOC emissions do not exceed the limits listed above.

4. Compliance with the VOC limits in Specific Condition No. 3 shall be determined by EPA Method 24, Determination of Volatile Matter Content, 40 CFR 60, Appendix A, adopted by reference in F.A.C. Rule 17-2.700. The manufacturer's stated VOC content shall be acceptable for the compliance evaluation if determined by EPA Method 24.

5. No objectionable odors shall be allowed from the cable fabrication and etching process.

6. Visible emissions from the process shall not exceed 5% opacity. Compliance shall be determined in accordance with DER Method 9.

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

8. An application for an operation permit must be submitted to the Central District office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-2.220).

PERMITTEE:
Kennedy Space Center

Permit Number: AC 05-195652
Expiration Date: June 30, 1992

Issued this 1st day
of November, 1991

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

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

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

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

Interoffice Memorandum

TO: Steve Smallwood

FROM: Clair Fancy BA

DATE: November 1, 1991

SUBJ: Approval of Construction Permit AC 05-195652
NASA-Kennedy Space Center

Attached for your approval and signature is a permit prepared by the Bureau of Air Regulation for the above mentioned agency to construct an exhaust system for the cable fabrication/etching process in Hangar N at the Kennedy Space Center in Brevard County, Florida.

No comments were received during the public notice period. However, the expiration date has been changed from December 31, 1991, to June 30, 1992.

I recommend your approval and signature.

CF/JR/plm

Attachments

CHF - Thank you. Well written permit. Thank John for his good work - 11-1-91

SENDER:

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

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

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

Consult postmaster for fee.

3. Article Addressed to:

Mr. Walter J. Murphy
Director D Eng. Development
John F. Kennedy Space Ctr.
NASA
Kennedy Space Ctr., Fl
32899

4a. Article Number
P 617 884 178

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

5. Signature (Addressee)

6. Signature (Agent)

7. Date of Delivery
10-21-91

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

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

P 617 884 178

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

UNITED STATES POSTAL SERVICE

Sent to: Walter Murphy	
Street & No.: NASA	
P.O., State & ZIP Code: Kennedy S C, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date AC 05-195 10-18-91	

PS Form **3800**, June 1990

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

October 18, 1991

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Walter T. Murphy
Director of Engineering Development
John F. Kennedy Space Center
National Aeronautics & Space Administration
Kennedy Space Center, Florida 32899

Dear Mr. Murphy:

Re: Permit No. AC 05-195652

The Department has not received any indication that NASA intends to continue with the above proposed permit mailed to you on June 4, 1991.

Unless you notify us in writing within 10 days of receipt of this letter, we will assume you do not intend to continue with this application. The Department will then remove this application from further consideration.

If you have any questions, please contact John Reynolds at (904) 488-1344.

Sincerely,

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

CHF/JR/plm

c: C. Collins, Central Dist.
D. Buff, P.E.

NASA/KSC ENVIRONMENTAL MANAGEMENT OFFICE

JOHN F. KENNEDY SPACE CENTER
MAIL CODE: DE-PMO-6
KSC, FL 32899

DATE: 10/28/91 NO. OF PAGES (INCLUDING LEADER SHEET): 2

TO: Patty Adams LOCATION: FDER/Tallahassee

PHONE: 904-488-1344 FAX #: 904-922-6979

FROM: Laurel Lichtenberger

PHONE: 407-867-4049 FAX #: 407-867-4812

MESSAGE: Patty,

This is to forward the advertisement affidavit for Permit No. AC 05-195652 per our conversation today. Thanks

BEST AVAILABLE COPY

CAPE PUBLICATIONS, INC.

The Times
Published Weekly on Wednesday

THE TRIBUNE
Published Weekly on Wednesday

FLORIDA TODAY
Published Daily

STATE OF FLORIDA
COUNTY OF BREVARD

Before the undersigned authority personally appeared Cynthia Frith who on oath says that he/she is Legal Advertising Clerk of the FLORIDA TODAY a newspaper published in Brevard County, Florida; that the attached copy of advertising being a Legal Notice in the matter of Exhaust System in the ______ Court

was published in the FLORIDA TODAY NEWSPAPER in the issues of July 31, 1991

Affiant further says that the said FLORIDA TODAY NEWSPAPER is a newspaper published in said Brevard County, Florida and that the said newspaper has heretofore been continuously published in said Brevard County, Florida regularly as stated above, and has been entered as second class mail matter at the post office in COCOA said Brevard 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 said newspaper.

Cynthia Frith

Sworn and subscribed to before me this 31 day of July A.D. 19 91

[signature]

State [illegible]

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

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit to NASA-Kennedy Space Center to construct an exhaust system for the cable fabrication etching process at the Kennedy Space Center, 1728 Hangar Road, Kennedy Space Center, Brevard County, Florida 32899. A determination of Best Available Control Technology (BACT) was not required. The Department is issuing this intent to issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

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

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

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

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

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

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

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

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

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

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

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

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

Any person may send written comments on the proposed action to Mr. Barry Andrews at the Department's Tallahassee address. All comments mailed within 14 days of the publication of this notice will be considered in the Department's final determination.
[illegible] 7/31, 1991,
Wednesday

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

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

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

Consult postmaster for fee.

3. Article Addressed to:
Mr. Walter T. Murphy
Director of Eng. Dev.
John F. Kennedy Space Ctr.
NASA
Kennedy Space Ctr, Fl
32899

4a. Article Number
P 832 539 843

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

7. Date of Delivery
6-11-91

5. Signature (Addressee)
Jean Ensminger/DE

6. Signature (Agent)

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

DOMESTIC RETURN RECEIPT

P 832 539 843

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

UNITED STATES POSTAL SERVICE

Sent to: Walter Murphy	
Street & No. NASA	
P.O., State & ZIP Code Kennedy SC, 32	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date 6-7-91 AC 05-195652	

PS Form **3800**, June 1990

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

June 4, 1991

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Walter T. Murphy
Director of Engineering Development
John F. Kennedy Space Center
National Aeronautics & Space Admin.
Kennedy Space Center, Florida 32899

Dear Mr. Murphy:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit for NASA to construct an exhaust system for the cable fabrication/etching process at the Kennedy Space Center, Brevard County, Florida.

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

Sincerely,

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

CHF/JR/plm

Attachments

c: C. Collins, Central District
D. Buff, P.E.

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of
Application for Permit by:

National Aeronautics & Space Administration
John F. Kennedy Space Center
Kennedy Space Center, FL 32899

DER File No. AC 05-195652

INTENT TO ISSUE

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

The applicant, NASA-Kennedy Space Center, applied on April 16, 1991, to the Department of Environmental Regulation for a permit to construct an exhaust system for the cable fabrication/etching process in Hangar N at the Kennedy Space Center, Brevard County, Florida.

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

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

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

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

The Petition shall contain the following information:

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

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

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

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

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

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

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

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

to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

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

Copies furnished to:

C. Collins, Central District
D. Buff, P.E.

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 6-7-91.

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

Clerk

6-7-91
Date

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

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit to NASA-Kennedy Space Center to construct an exhaust system for the cable fabrication/etching process at the Kennedy Space Center, 1728 Hangar Road, Kennedy Space Center, Brevard County, Florida 32899. A determination of Best Available Control Technology (BACT) was not required. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

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

The Petition shall contain the following information:

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

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have

the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

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

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

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

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

Technical Evaluation
and
Preliminary Determination

National Aeronautics and Space Administration
Brevard County
Kennedy Space Center, Florida

Exhaust System for Cable Fabrication/
Etching Process - Hangar N

Permit Number: AC 05-195652

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

June 4, 1991

I. Applicant Information

National Aeronautics and Space Administration
John F. Kennedy Space Center
Kennedy Space Center, Florida 32899

II. Source Information

A. Location

The proposed source will be located at the intersection of Schwartz Road and Kennedy Parkway, at the Kennedy Space Center, in Brevard County, Florida. The latitude and longitude are 28°19'16" North and 80°35'18" West, respectively.

B. Standard Industrial Classification Code (SIC)

Group No. 966, Space Research and Technology
Industry No. 9661, Space Research and Technology

C. Category

The Department received a complete application on April 16, 1991, for construction of an exhaust system for the cable fabrication/etching process at Hangar N. The proposed project will constitute a minor modification of a major emitting facility for volatile organic compounds.

This facility category is not in the list of the 28 Major Facility Categories, Table 500.1, Chapter 17-2, Florida Administrative Code.

III. Project Description/Emissions

The cable fabrication process begins with cleaning the end of the outer jacket cable by wiping it down with 1,1,1,-trichloroethane. The connector portion to be molded and the mold interior are cleaned with toluene, xylene, and methyl ethyl ketone. Isopropyl alcohol may be used to clean other areas. Less than 2 ounces of these solvents are used for each task. About two ounces of primer PR-420 may be applied on the connector backshell and braid. Mold Release MS-122 is applied to the inside of the mold. The cable connector is then inserted inside the mold and one of the following potting compounds, Stycast 2651 or PR-1590, is injected into the mold. The mold assembly is cured in an oven for 1 to 16 hours at 180°F.

The cable etching process is performed under the exhaust hood. The cable portion to be etched is cleaned with toluene and methyl ethyl ketone. The cable is then dipped in Tetra-etch solution. The cable is wiped clean with a cloth and allowed to air dry. The exhaust hood is vented above the roof at a rate of 1250 cfm. VOC emissions are estimated at 3.35 tons per year and are not expected to exceed acceptable ambient concentrations determined by the Department.

IV. Rule Applicability

The proposed project is subject to preconstruction review under the provisions of Chapter 403, Florida Statutes and Chapter 17-2, Florida Administrative Code (F.A.C.). The proposed source will be located in an area designated attainment for all criteria pollutants in accordance with F.A.C. Rule 17-2.140. The Kennedy Space Center is a major emitting facility for volatile organic compounds (VOC). This project is exempt from provisions of F.A.C. Rule 17-2.500, Prevention of Significant Deterioration. The proposed project shall be permitted under Rule 17-2.520, Sources Not Subject to Prevention of Significant Deterioration or Nonattainment Requirements. The applicable rule is F.A.C. Rule 17-2.620, General Pollutant Emission Limiting Standards.

IV. Conclusion

Based on the information provided by Kennedy Space Center, the Department has reasonable assurance that the proposed project, as proposed herein, will not cause or contribute to a violation of an ambient air quality standard, PSD increment, or any other technical provisions of Chapter 17-2 of the Florida Administrative Code.

6/7/01

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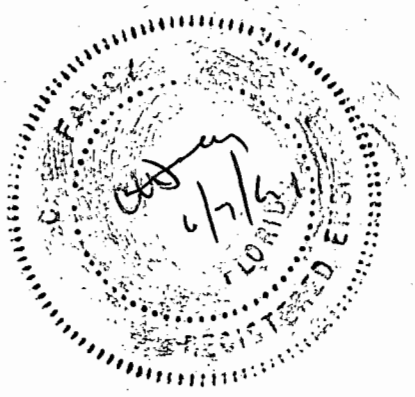
Based on the information provided by Kennedy Space Center, the Department has reasonable assurance that the proposed project, as proposed herein, will not cause or contribute to a violation of an ambient air quality standard, PSD increment, or any other technical provisions of Chapter 17-2 of the Florida Administrative Code.



Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

PERMITTEE:
National Aeronautics & Space Administration
Kennedy Space Center, FL 32899

Permit Number: AC 05-195652
Expiration Date: Dec. 31, 1991
County: Brevard
Latitude/Longitude: 28°33'43"N 80°39'36"W
Project: Exhaust System for Cable Fabrication/Etching Process - Hangar N

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 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 drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the construction of an exhaust system for the cable fabrication/etching process in Hangar N, located at 1728 Hanger Road, Kennedy Space Center, Brevard County, Florida.

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

Attachments are listed below:

1. Application received on April 16, 1991.

GENERAL CONDITIONS:

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

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

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

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

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

GENERAL CONDITIONS:

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

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

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

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

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

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

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

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

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

GENERAL CONDITIONS:

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

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

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

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

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

13. The permittee shall comply with the following:

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

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

GENERAL CONDITIONS:

report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

1. The construction and operation of this source shall be in accordance with the capacities and specifications stated in the application.

2. The cable fabrication and etching process shall be allowed to operate for up to 8,760 hours per year.

3. Hydrocarbon emissions (VOC) shall not exceed the following calculated values, and total VOC emissions from the source shall not exceed 18.4 lbs/day (rolling 90-day average) and 3.35 tons/year. Compliance shall be demonstrated by applying the following raw material utilization rates and VOC content factors:

Chemical	Utilization Rate (lbs/yr)	VOC (% by wt.)	VOC Emissions (lbs/yr)
Isopropanol	1,574	100	1,574
Methyl Ethyl Ketone	1,613	100	1,613
Acetone	791	100	791
Toluene	866	100	866

SPECIFIC CONDITIONS:

Xylene	870	100	870
1,1,1-Trichloroethane	528	100	528
PR-420 Brown	87	78	68
PR-1590	854	0	0
Stycast 2651	828	0	0
Catalyst 9	66	0	0
MS-122	402	99	398
Tetra-Etch	243	75	182
TOTAL			6,708

Other materials may be used if prior approval is obtained from the Department and if the total VOC emissions do not exceed the limits listed above.

4. Compliance with the VOC limits in Specific Condition No. 3 shall be determined by EPA Method 24, Determination of Volatile Matter Content, 40 CFR 60, Appendix A, adopted by reference in F.A.C. Rule 17-2.700. The manufacturer's stated VOC content shall be acceptable for the compliance evaluation if determined by EPA Method 24.

5. No objectionable odors shall be allowed from the cable fabrication and etching process.

6. Visible emissions from the process shall not exceed 5% opacity. Compliance shall be determined in accordance with DER Method 9.

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

8. An application for an operation permit must be submitted to the Central District office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-2.220).

PERMITTEE:
Kennedy Space Center

Permit Number: AC 05-195652
Expiration Date: December 31, 1991

Issued this _____ day
of _____, 1991

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

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

National Aeronautics and
Space Administration

John F. Kennedy Space Center
Kennedy Space Center, Florida 32899

NASA

Reply to Attn of DE-PMO-6

APR 10 1991

Florida Department of Environmental Regulation
Attn: Mr. Claire Fancy
Air Resources Division
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Air Pollution Source Construction Permit Application for Hangar N Cable Shop

Attached are four copies of the subject permit application and a check for $200.00 for the processing fee.

Please address any comments or questions to Mr. Mario Busacca of my staff at (407) 867-4049.

Walter T. Murphy

Walter T. Murphy
Director of Engineering Development

cc: J. Reynolds
E. Collins, C. Dist.

CERTIFIED

P 260 255 637 ✓

MAIL

NASA

National Aeronautics and
Space Administration

John F. Kennedy Space Center
Kennedy Space Center, Florida 32899

OFFICIAL BUSINESS
Penalty for Private Use $300

MAIL CODE DE-PMO-6

POSTAGE AND FEES PAID
National Aeronautics
and Space Administration
NASA-451

Florida Dept. of ~~Environ~~mental Regulation
Attn: Mr. Claire Fancy
Air Resources Division
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

KSC FORM 1-82 (REV. 12/87)

✓

UNITED TECHNOLOGIES USBI

USBI
P.O. Box 21212
Kennedy Space Center, Florida 32815

74-1292
724

00085665
085665

TWO HUNDRED DOLLARS NO CENTS

PAY TO THE ORDER OF
FLORIDA DEPT. OF ENVIRONMENTAL
REGULATION
TWIN TOWERS OFFICE BLDG.
2600 BLAIR STONE ROAD
TALLAHASSEE, FL 32301

DATE
3-14-91

CHECK AMOUNT
*******200.00

AUTHORIZED SIGNA

AUTHORIZED COUNTERSIGNA

NATIONAL BANK OF DETROIT-DEARBORN
611 WOODWARD, DETROIT, MICHIGAN 48226

USBI
OPERATION ACCOUNT

⑈085665⑈ ⑆072462927⑆ 00045956⑈

...Kennedy Space Center
ennedy Space Center, Florida 32899

APR 10 1991

DE-PMO-6

Florida Department of Environmental Regulation
Attn: Mr. Claire Fancy
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2600 Blair Stone Road
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Director of Engineering Development

UNITED TECHNOLOGIES USBI

USBI
P.O. Box 21212
Kennedy Space Center, Florida 32815

74-1292
724

CHECK NO.
00085665
085665

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PAY TO THE ORDER OF
FLORIDA DEPT. OF ENVIRONMENTAL
REGULATION
TWIN TOWERS OFFICE BLDG.
2600 BLAIR STONE ROAD
TALLAHASSEE, FL 32301

DATE 3-14-91
CHECK AMOUNT *******200.00

AUTHORIZED SIGNATURE

AUTHORIZED COUNTERSIGNATURE

NATIONAL BANK OF DETROIT-DEARBORN
611 WOODWARD, DETROIT, MICHIGAN 48226

USBI
OPERATION ACCOUNT

⑈085665⑈ ⑆072412927⑆ 00045956⑈

#200 pd.
4-16-91
Recpt. #15126

AC 05 - 195652

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: SPACE SHUTTLE BOOSTER REFURBISHMENT [X] New[1] [ ] Existing[1]

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

COMPANY NAME: NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA) COUNTY: BREVARD

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peeking Unit No. 2, Gas Fired) LABORATORY EXHAUST HOOD

SOURCE LOCATION: Street HANGAR N (1728), HANGAR ROAD City CAPE CANAVERAL AFS

UTM: East 540.3 North 3151.0

Latitude 28 o 19 ' 16 "N Longitude 80 o 35 ' 18 "W

APPLICANT NAME AND TITLE:

APPLICANT ADDRESS:

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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: Walter T. Murphy
Walter T. Murphy, Director of Engineering
Name and Title (Please Type) Development
Date: APR 10 1991 Telephone No. (407)867-2565

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 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: Walter T. Murphy
Walter T. Murphy
Name (Please Type)
National Aeronautics and Space Administration
Company Name (Please Type)
John F. Kennedy Space Center, KSC, FL 32899
Mailing Address (Please Type)

(Affix Seal)

Florida Registration No. Exempt per F.A.C. 17-4 Date: APR 10 1991 Telephone No. (407) 867-2565

[1]See Section 17-2.02(15) and (22), Florida Administrative Code, (F.A.C.)

SECTION II: GENERAL PROJECT INFORMATION

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

SEE ATTACHMENT A

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

Start of Construction 5-1-91 Completion of Construction 7-1-91

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

N.A.

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

N.A.

E. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? ____ Yes __X__ No

F. Normal equipment operating time: hrs/day 16 ; days/wk 5 ; wks/yr 52 ; if power plant, hrs/yr ____ ;

if seasonal, describe: OPERATION WILL DEPEND ON SPACE SHUTTLE LAUNCH RATE.

G. 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) requirements 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

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)

A. Raw Materials and Chemicals Used in your Process, if applicable: SEE ATTACHMENT A AND TABLE A.

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

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

1. Total Process Input Rate (lbs/hr): NOT APPLICABLE

2. Product Weight (lbs/hr): NOT APPLICABLE

C. Airborne Contaminants Emitted:

Name of Contaminant	Emission[1]		Allowed Emission[2] Rate per Ch. 17-2, F.A.C.	Allowable[3] Emission lbs/hr	Potential Emission[4]		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
VOC	1.6*	3.35	17-2.620	Ex 1st Tech	1.6*	3.35	TABLE A

* = 6,708 lbs/yr ÷ 4,160 hours/yr

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles[5] Size Collected (in microns)	Basis for Efficiency (Sec. V, It[5]
NONE				

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g., Section 17-2.05(6) Table II, E. (1), F.A.C. -- 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)

[5] If Applicable

E. Fuels NOT APPLICABLE

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

*Units Natural Gas, MMCF/hr; Fuel Oils, barrels/hr; Coal, 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 N.A. Maximum _____

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

TETRA ETCH AND WASTE APPLICATORS CONTAMINATED WITH SOLVENTS WILL BE COLLECTED IN SEPARATE DRUMS AND TRANSPORTED TO A FEDERALLY PERMITTED HAZARDOUS WASTE TSDF.

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

Stack Height: 32 ft. Stack Diameter: 1 ft.

Gas Flow Rate: 1250 ACFM Gas Exit Temperature: AMBIENT °F.

Water Vapor Content: AMBIENT % Velocity: 26.52 (1591 FPM) FPS

SECTION IV: INCINERATOR INFORMATION

NOT APPLICABLE

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.)
Lbs/hr Incinerated							

Description of Waste _____

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

Approximate Number of Hours of Operation per day _____ days/week _____

Manufacturer _____

Date Constructed _____ Model No. _____

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

Stack Height: _____ ft. Stack Diameter _____ Stack Temp. _____

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

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

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner [ ] Other (specify) _____

Brief description of operating characteristics of control devices: _____

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

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight – show derivation. NOT APPLICABLE

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. SEE ATTACHMENT A AND TABLE A.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test). TABLE A (% VOC X LBS/YR = VOC'S/YR)

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, etc.). NONE REQUIRED

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). NOT APPLICABLE

6. An 8½" 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. SEE ATTACHMENT B

7. An 8½" 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). SEE ATTACHMENT C

8. An 8½" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram. SEE ATTACHMENT D

9. An application fee of $20, unless exempted by Section 17-4.05(3), F.A.C. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit. NOT APPLICABLE

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

NOT APPLICABLE

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?
[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy) [ ] Yes [ ] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration

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

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:
5. Useful Life:
6. Operating Costs:
7. Energy:
8. Maintenance Cost:
9. Emissions:

Contaminant	Rate or Concentration

*Explain method of determining D 3 above.

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*:

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy*:

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*:

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy**:

h. Maintenance Costs:

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:

*Explain method of determining efficiency.

**Energy to be reported in units of electrical power – KWH design rate.

3.

a. Control Device:

b. Operating Principles:

c. Efficiency*:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

h. Maintenance Cost:

*Explain method of determining efficiency above.

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*:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

F. Describe the control technology selected:

1. Control Device:
2. Efficiency*:
3. Capital Cost:
4. Life:
5. Operating Cost:
6. Energy:
7. Maintenance Cost:
8. Manufacturer:
9. Other locations where employed on similar processes:

a.

(1) Company:

(2) Mailing Address:

(3) City:

(4) State:

(5) Environmental Manager:

(6) Telephone No.:

*Explain method of determining efficiency above.

(7) Emissions*:

Contaminant	Rate or Concentration

(8) Process Rate*:

b.

(1) Company:

(2) Mailing Address:

(3) City:

(4) State:

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

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions*:

Contaminant	Rate or Concentration

(8) Process Rate*:

10. Reason for selection and description of systems:

*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.

2. Instrumentation, Field and Laboratory

a) Was instrumentation EPA referenced or its equivalent? _____ Yes _____ No

b) Was instrumentation calibrated in accordance with Department procedures? _____ Yes _____ No _____ Unknown

B. Meteorological Data Used for Air Ouality Modeling

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

2. Surface data obtained from (location) _____

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

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

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

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

D. Applicants Maximum Allowable Emission Data

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

E. Emission Data Used in Modeling

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

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

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

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

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

ATTACHMENT A

HANGAR N CABLE SHOP
PROCESS DESCRIPTION

This permit application is for the cable fabrication process. This process is expected to emit minimal air pollutants. This operation supports the assembly and refurbishment of Space Shuttle Solid Rocket Booster (SRB) components and will be performed at Hangar N on the Cape Canaveral Air Force Station. USBI Company, a unit of Pratt & Whitney, which is a division of United Technologies Corporation, will be performing this operation as contractually directed by the National Aeronautics and Space Administration (NASA). The following is a brief description of the two tasks involved in this permit application.

The cable fabrication process is the first task. It begins with cleaning the end of the outer jacket cable by wiping it down with 1,1,1-trichloroethane. The connector portion to be molded, and the mold interior are cleaned with toluene or xylene, and then with methyl ethyl ketone. Isopropyl alcohol may be used to clean other areas. Less than 2 ounces of these solvents are used for each task. About two ounces of primer PR-420 may be applied on the connector backshell and braid. Mold Release MS-122 is applied to the inside of the mold. The cable connector is then inserted inside the mold and then one of the following potting compounds, Stycast 2651 or PR-1590 is injected into the mold. The mold assembly is then cured in an oven for 1 to 16 hours at 180° F.

The second task is the cable etching process. This task is performed in its entirety in the exhaust hood. The cable portion to be etched is first cleaned with toluene and then with methyl ethyl ketone. The cable is then dipped in Tetra-etch solution. The cable is wiped clean with a cloth and allowed to air dry.

The exhaust hood is vented from room 107 to a point above the roof. The exhaust hood vents at a rate of 1250 CFM. The ovens have passive venting. The estimated material to be used annualy (24 flights) is 30 gallons of Tetra-etch, 9 gallons of PR-420, 60 gallons of Stycast 2651, and 96 gallons of PR-1590, 240 gallons MEK, 240 gallons of IPA, 48 gallons of 1,1,1-trichloroethane, 120 gallons of acetone, 120 gallons of toluene, 120 gallons of xylene, 8 gallons of Catalyst 9, and 30 gallons of MS-122. Proposed VOC emission data from this process is shown in Table A. Material Safety Data Sheets for these chemical products are found in Attachment E.

All hazardous waste generated from these tasks will be collected in drums and segregated based on chemical compatability. All emissions from exhaust hood stack are clear colorless emissions.

HANGAR N CABLE SHOP VOC EMISSIONS

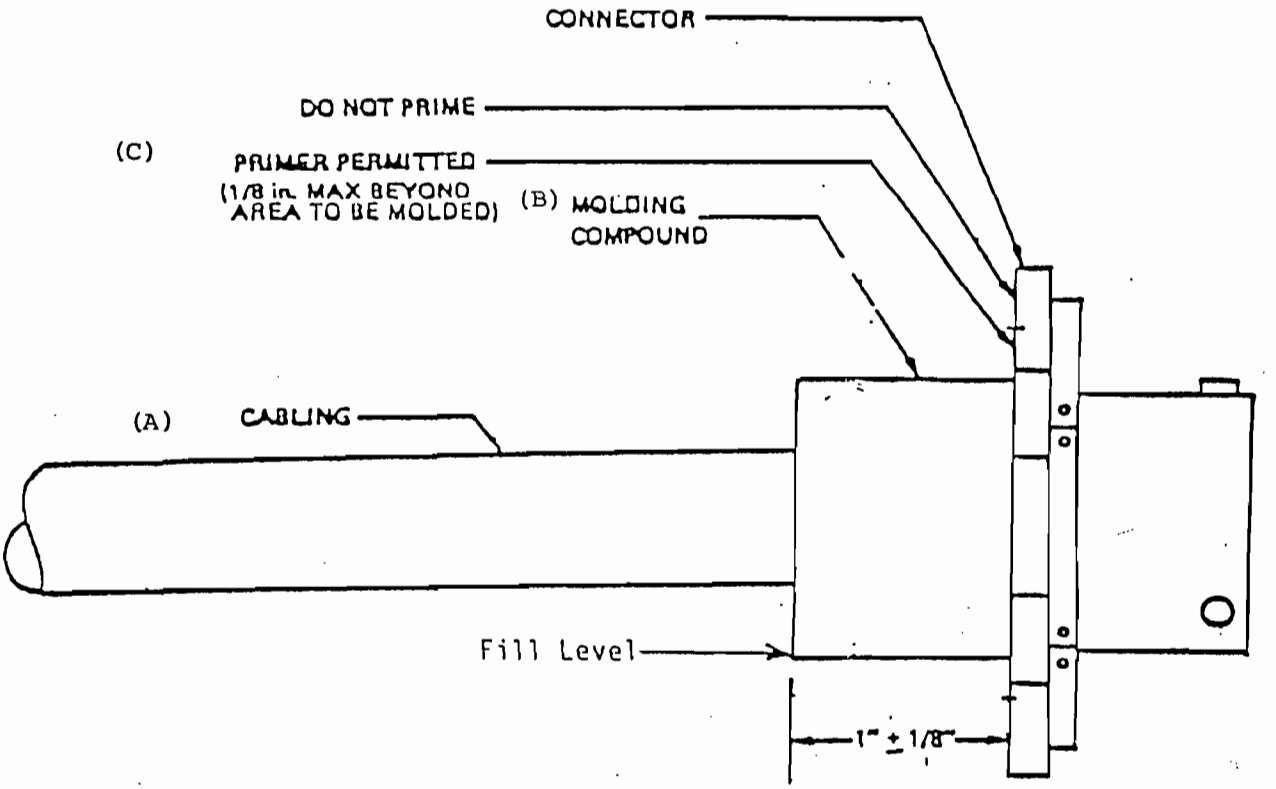
CHEMICAL PRODUCT	CHEMICAL	PERCENT VOC (W/W)	UTILIZATION RATE (POUNDS/YEAR)(i)	VOC EMISSION RATE (POUNDS/YEAR)(ii)	VOC EMISSION RATE (TONS/YEAR)
ISOPROPANOL	ISOPROPANOL	100	1,574	1,574	0.79
METHYL ETHYL KETONE	METHYL ETHYL KETONE	100	1,613	1,613	0.81
ACETONE	ACETONE	100	791	791	0.40
TOLUENE	TOLUENE	100	866	866	0.43
XYLENE	XYLENE	100	870	870	0.44
1,1,1-TRICHLOROETHANE	1,1,1-TRICHLOROETHANE	100	528	528	0.26
PR-420 BROWN	MIXTURE	78	87	68	0.03
PR-1590	MIXTURE	0	854	0	0.00
STYCAST 2651	MIXTURE	0	828	0	0.00
CATALYST 9	MIXTURE	0	66	0	0.00
MS-122	MIXTURE	99	402	398	0.20
TETRA-ETCH	MIXTURE	75	243	182	0.09
TOTAL ANNUAL VOC'S				**6708**	**3.35**

(i) UTILIZATION RATE BASED ON 24 SPACE SHUTTLE FLIGHTS PER YEAR
(ii) VOC% X UTILIZATION RATE/YEAR = VOC EMMISION RATE/YEAR
SOURCE: USBI CO. 1991

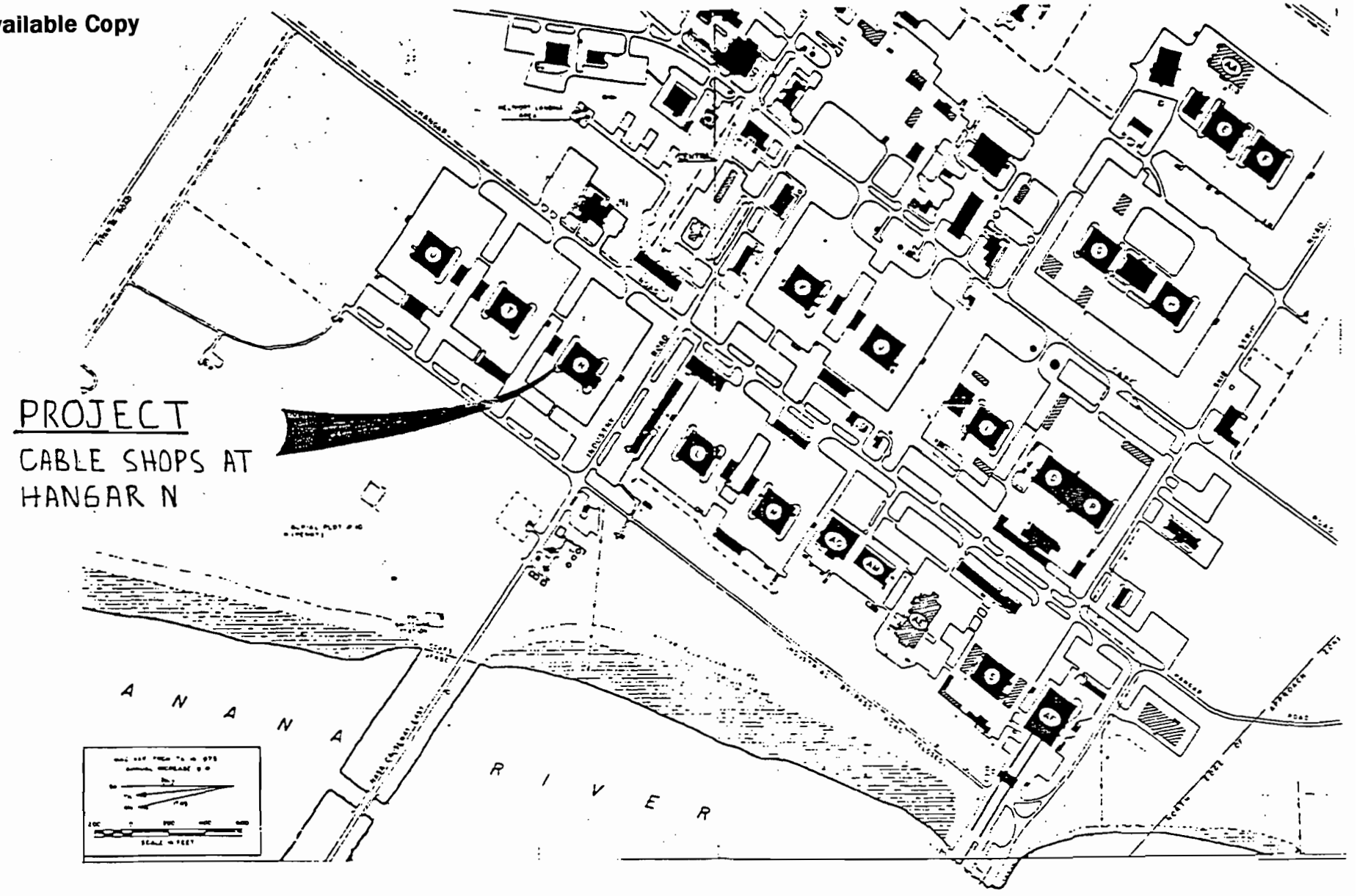
TABLE A

ATTACHMENT B

MOLDING PROCESS

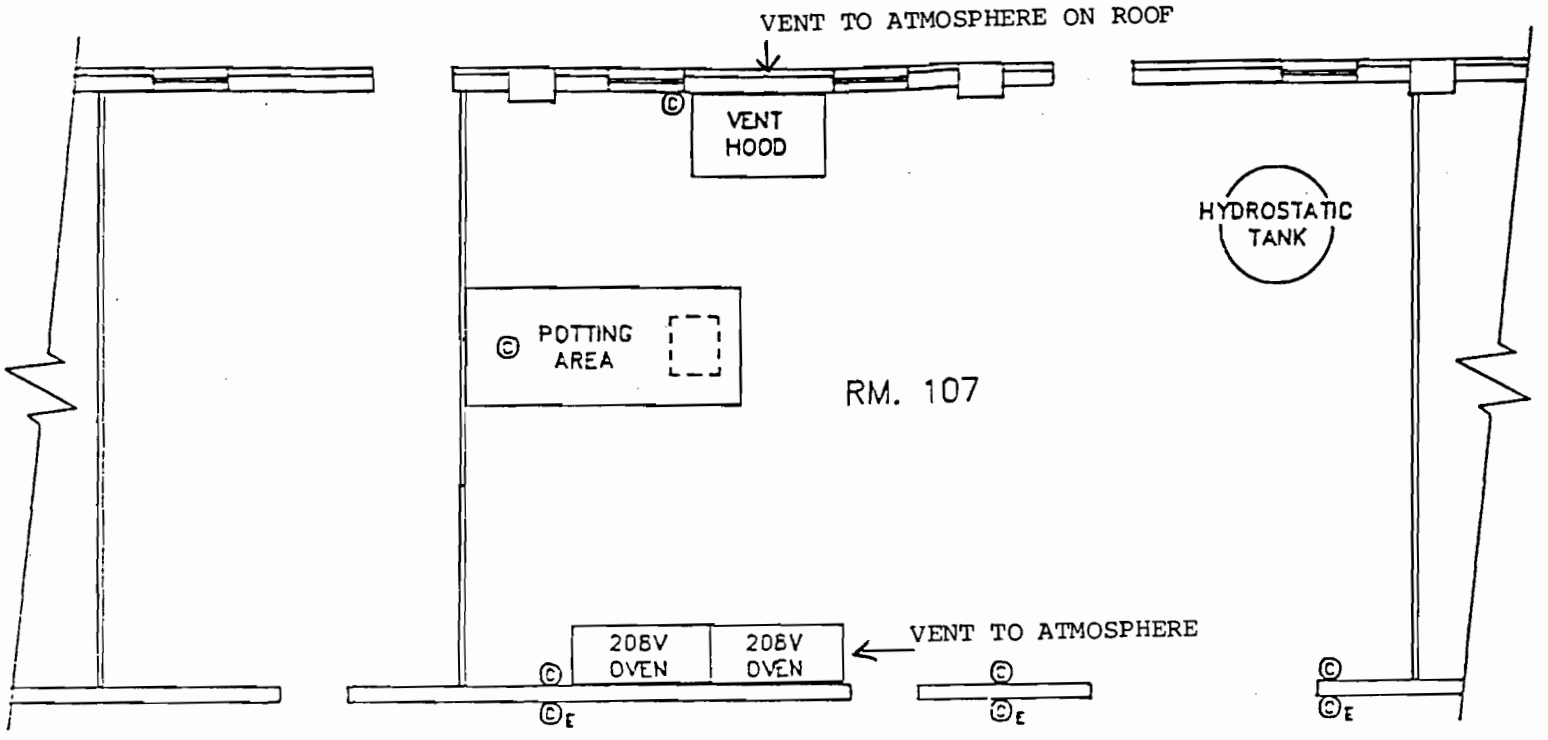


AREA	APPLICATION	POLLUTANT RESULT
A	1,1,1-TRICHLOROETAHNE	VOC'S TO ATMOSPHERE
A	TETRA ETCH	VOC'S TO ATMOSPHERE AND SOLUTION TO DRUM
B	ISOPROPYL ALCOHOL	VOC'S TO ATMOSPHERE
	METHYL ETHYL KETONE	VOC'S TO ATMOSPHERE
	ACETONE	VOC'S TO ATMOSPHERE
	TOLUENE	VOC'S TO ATMOSPHERE
	XYLENE	VOC'S TO ATMOSPHERE
B	STYCAST 2651	NO POLLUTANTS
	PR-1590	NO POLLUTANTS
C	PR-420	VOC'S TO ATMOSPHERE



VICINITY MAP

ATTACHMENT C



EQUIPMENT LAYOUT PLAN – FIRST FLOOR

HANGAR N

CABLE SHOPS

ATTACHMENT D

ATTACHMENT E

MATERIAL SAFETY DATA SHEETS

miller-stephenson

MS 122 Fluorocarbon Release Agent

IDENTIFICATION

Name:
MS 122 Fluorocarbon Release Agent

Chemical Family:
Not applicable

Synonyms:
Not applicable

Formula:
CC13F
CC12F2
CC12FCC1F2

CAS Name:	CAS Registry No.
Trichlorotrifluoroethane	76 13 1
Trichlorofluoromethane	75 69 4
Dichlorodifluoromethane	75 71 8

Manufacturer/Distributor:
Miller Stephenson Chemical Co.

Medical Emergency Phone:
(203) 797 2212

Address:
George Washington Highway
Danbury, Conn. 06810

Transportation Emergency Phone:
(800) 424 9300

PHYSICAL DATA

Boiling Point (°F): 75

Percent Volatile by Volume: 99

Density: 1.6g/cc @77°F

Vapor Pressure: 250m-n Hg @68°F

Vapor Density (Air = 1): 6.0 @68°F

Solubility in H_2O: negligible

pH Information: 5.0

Evaporation Rate (n BuAc = 1):

Form: Dispersion

Appearance: Milky

Color: White

Odor: Faint solvent odor.

HAZARDOUS COMPONENTS

Material s):	App. Conc. %:
Trichlorotrifluoroethane	3–5
Trichlorofluoromethane	45–50
Dichlorodifluoromethane	45–50
Telomer of Tetrafluoroethylene	1–2

HAZARDOUS REACTIVITY

Stability:
Material is stable. However, avoid spraying near open flames or red hot coils.

Decomposition:
This compound can be decomposed by high temperatures. (>300°F) emitting halogen acids, phosgene in smaller amounts and perfluorocarbons.

Incompatibility:
Finely divided reactive metals.

Polymerization:
Will not occur.

FIRE AND EXPLOSION DATA

Flash Point: None

Method: TOC

Autoignition Temperature:
Not determined

Flammable Limits in Air, % by Vol.
Non Flammable

Autodecomposition Temperature:
Not determined

Fire and Explosion:
Pressurized aerosol containers at elevated temperatures may vent, rupture or burst and add to flying and falling debris. Intense heat may cause decomposition with emission of halogen acids.

FIRE AND EXPLOSION DATA
(Cont)

Extinguishing Media:
"Alcohol" foam. Dry powder (sand or Met L X). CO_2.

Special Fire Fighting Instructions:
Evacuate personnel to a safe area. Decomposition at flame temperatures forms potentially toxic compounds. Self contained breathing apparatus may be required if cans rupture and contents are spilled under fire conditions.

HEALTH HAZARD INFORMATION

Principal Health Hazards:

Inhalation: Vapor is heavier than air and can cause suffocation by reducing oxygen available. Excessive inhalation of concentrated vapor may lead to dizziness, narcosis, anesthesia, cardiac irregularities, unconsciousness or death. Excessive inhalation of pyrolyzed fumes: flu like "polymer fume fever."

Skin: Mild skin irritant. Repeated skin contact can cause defatting of the skin.

Eye: Contact will cause irritation.

Oral: Although the oral toxicity is low, ingestion is to be avoided.

Exposure Limits:

Material	TLV (ACGIH)	PEL (OSHA)
Dichlorodifluoromethane	1000 ppm	1000 ppm
Trichlorotrifluoroethane	1000 ppm	1000 ppm
Trichlorofluoromethane	1000 ppm	1000 ppm
MS = 122 calc.)	Cannot be determined	

Safety Precautions: Avoid breathing vapors and liquid contact with skin and eyes. Wash hands thoroughly after handling. Avoid contamination of tobacco or smoking with contaminated hands.

First Aid:

Inhalation: Move patient to fresh air. If necessary, give artificial respiration or oxygen. If breathing is difficult, call a physician. DO NOT give epinephrine or similar drugs as such drugs may induce ventricular arrhythmia. Pyrolized fumes inhalation: Normal recovery occurs with 1 2 days.

Note to Physician: Because of a possible increased risk of eliciting cardiac dysrythmias, catacholamine drugs, such as epinephrine, should be considered only as a last resort in life threatening situations.

Eye: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Skin: The compound is not likely to be hazardous by skin contact, but flushing skin is advisable after use and on contact.

Oral: If swallowed, do not induce vomiting. Immediately give two glasses of water or activated charcoal slurry. Never give anything by mouth to an unconscious person. To prepare activated charcoal slurry, suspend 50 g activated charcoal in 400 ml water. Shake well. Administer 5 ml/kg or 350 ml for average adult.

Medical Conditions Possibly Aggravated by Exposure:

Cardiovascular Disease: See Principal Health Hazards: Inhalation section.

HEALTH HAZARD INFORMATION (Cont)

Other Health Hazards:

None of the components in this chemical are listed as a carcinogen by IARC, NTP, or OSHA. Based on animal studies and human experiences, these fluorocarbons pose no hazard to man relative to systemic toxicity, carcinogenicity, mutagenicity, or teratogenicity when occupational exposures are below its recommended TLV.

PROTECTION INFORMATION

Generally Applicable Control Measures:
Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low places. Do not consume food, drink, or tobacco in the areas where they may become contaminated with this material.

Personal Protective Equipment:
Protective gloves should be used to avoid prolonged or repeated exposure. Do not spray liquid on hands. Chemical splash goggles should be available for use as needed to prevent eye contact. Do not direct spray to eyes.

DISPOSAL INFORMATION

Spill, Leak or Release:
Propellant vapors tend to concentrate in low places. Ventilate area. Dike spill, collect on absorbent material and transfer to steel drums for recovery or disposal. Flush spill area with water. Do not burn. Comply with federal, state, and local regulations on reporting releases.

Waste Disposal:
Do not puncture or incinerate aerosol cans. Treatment, storage, transportation, and disposal must be in accordance with federal, state, and local regulations.

SHIPPING INFORMATION

Domestic - Other Than Air (DOT)

Proper Shipping Name: Compressed gas NOS Dichlorodifluoromethane
Hazard Class: 2
UN No.: 1956
DOT Label: Green, Non flammable Gas
DOT Placard:

International Water or Air IMO/ICAO

Proper Shipping Name: Compressed gas, NOS Dichlorodifluoromethane
Hazard Class: 2
UN No: 1956
IMO/ICAO Label: Green, Non flammable Gas

Other Information

Shipping Containers: Aerosol Cans

Storage Conditions: Do not store near sources of heat, in direct sunlight or where temperature exceeds 49°C /120°F. Do not puncture or damage containers. Do not store or consume food, drink or tobacco in area where it has become contaminated with this material. Freezing will affect the physical condition but will not damage. Thaw and mix before using. Rotate stock to shelf life of one year

SHIPPING INFORMATION
(Cont.)

Date Revised: 1/89

Person Responsible:
Janet Stephens
Miller-Stephenson Chemical Co., Inc.
George Washington Highway
Danbury, Conn. 06810
(203) 743-4447

MATERIAL SAFETY DATA SHEET

SECTION I

PRODUCT NAME:	PR-1590 Amber, Part A	MSDS IDENTIFICATION NO:	MS1962C00
		DATE OF ISSUE:	11-11-85
DESCRIPTION:	Polyether Polyol Compound.	PREPARED BY:	RW
MANUFACTURER:	Products Research & Chemical Corporation 5430 San Fernando Road, P.O. Box 1800, Glendale, CA 91209		
EMERGENCY TELEPHONE:	(818) 240-2060		

SECTION II - HAZARDOUS INGREDIENTS

CHEMICAL NAME	COMMON NAME	CAS NO	OSHA PEL	CALOSHA PEL	ACGIH TLV
None					

SECTION III - PHYSICAL AND CHEMICAL CHARACTERISTICS

Boiling Point, °F.:	Not applicable.	Specific Gravity:	1.07
Vapor Pressure, mm Hg:	Not applicable.	% Volatiles, by Vol:	None.
Vapor Density:	Not applicable.	Evaporation Rate:	Not applicable.
Solubility in Water:	Negligible.		

SECTION IV - PHYSICAL HAZARD INFORMATION

Flash Point:	Not flammable.	Flammable Limits:	Not flammable.
Extinguishing Media:	CO_2, dry chemical, foam, water fog.		
Spec. Fire Fighting Proc:	Use air supplied respirator.		
Unusual Fire Hazards:	None known.		
Stability:	Stable.		
Incompatibility:	None known.		
Decomposition products:	Oxides of carbon and nitrogen.		
Hazardous polymerization:	Will not occur.		

SECTION V - HEALTH HAZARD INFORMATION

EFFECTS OF OVER-EXPOSURE:

Eyes:	Irritation.
Skin:	Local irritation.
Inhalation:	Irritation of respiratory tract.
Ingestion:	None known.

SECTION VI - EMERGENCY FIRST AID PROCEDURES

Eyes:	Flush with luke warm water for 15 minutes. If symptoms persist, consult physician.
Skin:	Wash with soap and water. If symptoms persist, consult a physician.
Inhalation:	Remove to fresh air. If symptoms are present consult a physician.
Ingestion:	Consult a physician.

SECTION VII - SUGGESTED CONTROL PROCEDURES

Ventilation:	Adequate to minimize exposure to irritating vapors.
Skin Protection:	Solvent resistant gloves.
Eye Protection:	Safety glasses.

SECTION VIII - SPILL OR LEAKAGE PROCEDURES	
Release or Spillage:	Cover with absorbant. Scoop into containers. Clean-up residue with 1,1,1 -trichlorethane.
Waste Disposal:	Not a hazardous waste according to EPA regulations. Consult State regulations prior to disposal of spillage.

SECTION IX - SPECIAL PRECAUTIONS
None.

The information provided herein is, to the best of the manufacturer's knowledge, current, accurate and complete, based on information reasonably available.

MATERIAL SAFETY DATA SHEET

SECTION I

PRODUCT NAME:	PR-1590, Amber, Black, Part B	MSDS IDENTIFICATION NO:	MS0752E03
		DATE OF ISSUE:	08-18-87
		REPLACES:	MS0752E02
DESCRIPTION:	Polyurethane Polymer Compound.	PREPARED BY:	RBW
MANUFACTURER:	Products Research & Chemical Corporation 5430 San Fernando Road, P.O. Box 1800, Glendale, CA 91209		
EMERGENCY TELEPHONE:	(818) 240-2060		

SECTION II - HAZARDOUS INGREDIENTS

CHEMICAL NAME	COMMON NAME	CAS NO	OSHA PEL	ACGIH TLV TWA	ACGIH TLV STEL
Polyether Polyol polymer with toluene diisocyanate	Polyurethane Prepolymer	9057-91-4	*	*	*

* The TLV for TDI (CAS 26471-62-5) is 0.005 ppm.

SECTION III - PHYSICAL AND CHEMICAL CHARACTERISTICS

Boiling Point, °F.:	Not applicable.	Specific Gravity:	1.06
Vapor Pressure, mm Hg:	Not applicable.	VOC, g/l (Mixed):	0
Vapor Density:	Not applicable.	Evaporation Rate:	Not applicable.
Solubility in Water:	Negligible.		

SECTION IV - PHYSICAL HAZARD INFORMATION

Flash Point:	Not flammable. Flammable Limits: Not flammable.
Extinguishing Media:	CO_2, dry chemical, foam, water fog.
Spec. Fire Fighting Proc:	Use air supplied respirator. Use water to cool heat exposed containers.
Unusual Fire Hazards:	High temperatures may cause pressure buildup in closed containers.
Stability:	Stable.
Incompatibility:	Water, alcohols, strong bases, amines.
Decomposition products:	Oxides of carbon and nitrogen; possible traces of HCN.
Hazardous polymerization:	Will not occur.

SECTION V - HEALTH HAZARD INFORMATION

EFFECTS OF OVER-EXPOSURE:

Eyes:	Irritation, watering and possible reversible corneal damage.
Skin:	Local irritation and discoloration. May cause an allergic rash in sensitized individuals.
Inhalation:	Irritation of the nose, throat, lungs and eyes, with watering eyes, soreness in the throat, and tightness in the chest with possible difficulty in breathing. May produce asthma-like symptoms in sensitized individuals. Individuals suffering from asthma of other chronic respiratory conditions may exhibit a heightened sensitivity to isocyanates and should avoid inhalation exposure.
Ingestion:	Irritation and possible corrosive action in the mouth, stomach tissue and digestive tract.

LISTED CANCER AGENT?

_____ NO: Nothing contained in this product is found in the lists below.

__X__ YES: _____ Federal OSHA __X__ NTP __X__ IARC

SECTION VI - EMERGENCY FIRST AID PROCEDURES	
Eyes:	Flush with luke warm water for 15 minutes. If symptoms persist, consult physician.
Skin:	Wash with soap and water. If symptoms persist, consult a physician.
Inhalation:	Remove to fresh air. If symptoms are present consult a physician.
Ingestion:	Give milk or water to drink. Consult physician.

SECTION VII - SUGGESTED CONTROL PROCEDURES	
Ventilation:	General ventilation to maintain vapors below TLV. When using in confined areas, or in other circumstances likely to produce airborne levels of isocyanate in excess of TLV, use an air-supplied respirator.
Skin Protection:	Solvent resistant gloves.
Eye Protection:	Safety glasses.

SECTION VIII - SPILL OR LEAKAGE PROCEDURES	
Release or Spillage:	Cover with absorbant material, add decontamination solution * and allow to react for 10 minutes. Collect in containers, add additional decontamination solution and keep loosely covered for 48 hours.
Waste Disposal:	Not a hazardous waste according to EPA regulations. Consult State regulations prior to disposal of spillage.

SECTION IX - SPECIAL PRECAUTIONS
Avoid moisture contamination which will cause CO_2 pressure. Do not reseal containers if moisture contamination is suspected. Avoid ingestion.

*Decontamination solution: 5% concentrated ammonia, 2% detergent, 93% water.

The information provided herein is, to the best of the manufacturer's knowledge, current, accurate and complete, based on information reasonably available.

SAFETY DATA

EMERSON AND CUMING, INC.
A GRACE CO.
77 DRAGON COURT,
WOBURN, MA 01888

EMERGENCY/SAFETY INFORMATION:(617)935-4850
OR:(617)938-8630
ADDITIONAL MSDS:(617)828-3300

MSDS PREPARED BY: David Haas
DATE PREPARED: 1/4/90
SUPERCEDES: 11/21/89
DOCUMENT NO.: 150255

SECTION I - IDENTIFICATION

PRODUCT NAME: STYCAST 2651 Black

General Chemical Description: Filled Bisphenol A/Epichlorohydrin-based epoxy resin

SECTION II-INGREDIENTS

Hazardous Ingredients	Content by Weight	Maximum Exposure Value (8 hour time-weighted average) OSHA PEL	ACGIH TLV
Epoxy resin	40-50%	Not Established	Not Established
Mica	40-50%	3 mg/m3	3 mg/m3
Phenyl Glycidyl Ether	< 2%	1 ppm	1 ppm
Non-Hazardous Pigments	< 1%	Not Applicable	

See "Health Hazard Data".

All components of this product are listed on the EPA Toxic Substance Control Act Inventory

This product does not contain any reportable quantities of substances regulated by the SARA amendments to RCRA.

SECTION III-PHYSICAL DATA

Boiling Point (°F): Not Determined
Vapor Pressure at 25°C: < 1 mm Hg
Volatiles (% by weight): Negligible
Appearance and Odor: Black liquid

Specific Gravity (water=1): 1.65
Solubility in water: Negligible
Vapor Density: Heavier than air

STYCAST 2651 Black

SECTION IV-FIRE AND EXPLOSION HAZARD DATA

Flash Point (°F): 256°F (Pensky-Martens Closed Cup: ASTM D93)

Flammable Limits: Not Established

Extinguishing Media: Carbon dioxide, dry chemical, foam, water fog.

Unusual Fire or Explosion Hazards: In reaction with many curing agents, considerable heat may be evolved. Considerable smoke and toxic smoke or vapors may be evolved as a result of uncontrolled exothermic reaction when large masses of material react with curing agents. Toxic vapors may be evolved upon exposure to heat or open flame.

Special Firefighting Procedures: Firefighters should wear self-contained breathing apparatus.

SECTION V-REACTIVITY DATA

Product Stability: Product is stable; hazardous polymerization will not occur.

Incompatibilities: strong oxidizers, amines, amides, strong Lewis or mineral acids, thiosulfates, carboxylic acids, alcohol, mercaptans. Reaction with curing agents is exothermic;smoke or toxic fumes may be evolved if heat of reaction becomes excessive due to high curing temperature or curing of large masses of material.

Hazardous decomposition products: Carbon monoxide, carbon dioxide, oxides of nitrogen.

Conditions to avoid: Storage in open containers, exposure to heat and/or open flame, uncontrolled mixing with (or exposure to) incompatible substances (above)

STYCAST 2651 Black

----------SECTION VI-SPILL OR LEAK PROCEDURES----------

Handling Precautions: See section VIII

For small spills: Wipe up, or absorb with vermiculite or other absorbent material.
Collect waste in sealed containers.
Scrub area with soapy water and rinse. Prevents rinses from entering drains or other waterways.
Spilled material and water rinses are classified as chemical waste, and must be disposed of in accordance with current local, state, and federal regulations.

For large spills: Turn on ventilation equipment to evacuate vapors from the area.Dike area to contain spilled material and to prevent runoff into drains, sewers, and other waterways.
Shovel or pump to drum or salvage tank.
Absorb residual material with sand, vermiculite, or other absorbent material.
Scrape or shovel absorbed waste and absorbent into containers.
Scrub area with soapy water and rinse. Prevents rinses from entering drains or other waterways.
Spilled material and water rinses are classified as chemical waste, and must be disposed of in accordance with current local, state, and federal regulations.

----------SECTION VII-SPECIAL PRECAUTIONS----------

The recomendations described in this section are provided as general guidance for minimizing exposure when handling this product. Because usage conditions will vary depending on customer application, specific safe handling procedures should be developed by a person knowledgeable in the intended usage conditions and equipment.

Personal Protection: This product can cause eye irritation. Prevent eye contact through the use of chemical safety glasses, goggles, or a face shield selected with regard to conditions of use and exposure potential. This product can cause skin irritation, and may cause skin sensitization responses. Wear gloves and protective clothing to prevent exposure. Remove contaminated clothing and wash before reuse. Do not ingest or swallow this material.

Storage: Keep container closed when not in use. Consult Technical Data Sheet for storage instructions.

Ventilation Requirements: Prevent breathing of vapors, mist, or spray. Use only with proper mechanical exhaust ventilation. Wear an appropriate, properly fitted respirator when contaminant levels exceed the recommended exposure limits.

Flammability/ Explosion Precautions: Keep away from intense heat, open flames.

STYCAST 2651 Black

SECTION VIII-HEALTH HAZARD DATA

Route of Exposure: Skin Contact/Absorption, Inhalation.

Medical Conditions Aggravated by Exposure: No data available for this product mixture.

Effects of Acute Overexposure	Emergency First Aid Procedures
Inhalation	
Inhalation of vapors at elevated temperatures may cause irritation.	Remove to fresh air. Give oxygen if breathing difficult; give artificial respiration if not breathing; get immediate medical attention.
Eye contact	
Contains materials that are moderately irritating to the eyes.	Immediately flush with plenty of water for at least 15 minutes. Get medical attention.
Skin contact	
Contains materials that can cause moderate irritation to the skin. Prolonged exposure may result in skin sensitization	Wash affected area with soap and water. Get medical attention if irritation persists.
Ingestion	
Harmful if swallowed.	Dilute with water. Get immediate medical attention

STYCAST 2651 Black

Effects of Chronic Overexposure:
Although the significance is unknown, the DGEBA epoxy resin in this product has been shown to be mutagenic in some microbal tests, but has failed to show mutagenicity in others. Chromosomal aberrations were observed in cultured rat liver cells. Two-year bioassays on mice exposed by the dermal route to DGEBA resins yielded only very limited evidence of weak carcinogenicity. Based on this and other evidence, the International Agency for Research on Cancer (IARC) concluded in 1988 that DGEBA epoxy resins are not classifiable as carcinogens.

Recent studies indicate that Butyl and Phenyl Glycidyl Ethers may induce mutagenic changes in laboratory animals. This has not been related to human exposures, however, good ventilation and industrial hygiene practices should be followed when handling compounds containing either BGE or PGE.

GET MEDICAL ATTENTION IF SYMPTOMS PERSIST

SAFETY DATA

EMERSO
77 DRAGON COURT
WOBURN, MASSACHUSETTS 01888

OR: (617)938-8630
ADDITIONAL MSDS: (617)828-3300

SECTION 1 IDENTIFICATION

PRODUCT NAME: CATALYST 9

General Chemical Description: Aliphatic Amine blend

SECTION 2 INGREDIENTS

Components	% by Weight	Exposure Guidelines OSHA PEL	ACGIH TLV
Tetraethylene Pentamine	60-70%	NE	NE
Triethylene Tetramine	20-30%	NE	Ne
Pentaethylene Hexamine	10%	NE	NE

SECTION 3 PHYSICAL DATA

Boiling Point (Degree °F): 604
Vapor Pressure (mm Hg @ 25°C): < 0.001
Percent Volatiles by Weight: ND
Specific Gravity (water = 1): 0.99
Solubility in Water: Soluble
Vapor Density: Heavier than air
Appearance and Odor: Amber liquid, amine odor

SECTION 4 FIRE AND EXPLOSION HAZARD DATA

Flash Point (Degree °F):
280

Flammable Limits:
Not Established

Extinguishing Media:
Use carbon dioxide, dry chemical, foam, water fog.

Unusual Fire or Explosion Hazard:
Decomposition and combustion products may be toxic. Closed containers may violently rupture under fire conditions.

breathing apparatus and full protective equipment. Cool exposed containers with water to prevent pressure buildup. If large quantities of material are involved, evacuate area and fight fire from a safe distance.

SECTION 5 REACTIVITY DATA

Product Stability:
Product is stable under normal handling and storage conditions. Hazardous polymerization will not occur; however, review reactivity data concerning conditions to avoid and incompatible substances.

Incompatibility:
Incompatible with strong oxidizers, acids, bases, epoxides.

Hazardous Decomposition Products:
Carbon monoxide, carbon dioxide, oxides of nitrogen, amines and other organic substances may be formed during combustion. The chemical nature and quantity of decomposition by-products will vary widely depending on the conditions of combustion.

Conditions to Avoid:
Avoid storage in open containers, exposure to open flame or uncontrolled exposure to heat, uncontrolled mixing with epoxies or exposure to incompatible substances.

SECTION 6 RELEASE RESPONSE DATA

Spill response operations must be conducted in accordance with the provisions of OSHA 29 CFR 1910.120. Review the entire MSDS before proceeding with spill response.

Small Spills:
Activate available exhaust ventilation equipment in the immediate spill area. Wipe up or absorb spilled material with vermiculite or other similar material. Wash area with soapy water to remove residue. Collect absorbed material and water rinses in appropriate containers. Dispose of in accordance with current Federal, State, and local regulations.

Large Spills:
Limit access to the immediate spill area. Shut off source of the release if this can be done without risk of injury. Activate available exhaust ventilation systems in the area. Dike area to contain the spill and prevent releases to sewers, drains or other waterways. Collect spilled material for salvage/disposal. Apply absorbent material to soak up residue. Wash area with soapy water. Prevent runoff from entering waterways. Transfer absorbed material and water rinses to appropriate waste containers. Dispose of in accordance with current Federal, State and local regulations.

The recommendations described in this section are provided as general guidance for minimizing exposure when handling this product. Because usage conditions will vary depending on customer application, specific safe handling procedures should be developed by a person knowledgeable in the intended usage conditions and equipment. Employees must be properly trained in safe handling of this product prior to to use.

Personal Protection:

This product can cause eye burns. Prevent eye contact through the use of a face shield used in conjunction with either splash-proof chemical goggles or chemical safety glasses. This product can cause skin burns and may cause allergic skin responses. Components of this product may also be absorbed through the skin. Wear appropriate protective gloves, a proper chemical-resistant apron and additional impervious clothing to prevent all skin contact, contamination of clothing and possible absorption through the skin. Normal work clothing should be washed before re-use. Wash hands and face thoroughly after handling this product and before eating, drinking or smoking. Emergency eye wash facilities and safety shower must be available.

Ventilation Recommendations and Respiratory Protection:

Provide effective mechanical exhaust ventilation to draw vapors, mists, or fumes generated during processing away from the worker and to prevent routine inhalation. Ventilation must be sufficient to prevent respiratory irritation, as vapors can produce irritation and may cause allergic respiratory reactions/sensitization. Use an appropriate, properly fitted respirator if symptoms of exposure appear. The type of respiratory protection selected (SCBA, air-purifying etc.) will depend on the conditions of use. Observe OSHA regulations for respiratory protection (29 CFR 1910.134). It should be noted that engineering controls and personal protective equipment may not be sufficient to protect persons already sensitized to this material.

Storage:

Store in a cool, dry location with adequate ventilation. Keep container tightly sealed when not in use. Keep away from open flames and heat sources. Consult the product Technical Bulletin for detailed storage information.

SECTION 8 HEALTH DATA

Routes of Exposure:

Skin and eye contact, inhalation of vapors.

Medical Conditions Aggravated by Exposure:

Exposure may aggravate preexisting skin, eye and/or respiratory disorders.

Eye Contact:

Contains materials corrosive to the eyes; may cause burns and possible corneal injury. Permanent impairment of vision or blindness may occur.

tering. This product may cause skin sensitization/allergic skin reactions which may be severe in certain individuals. May be harmful if absorbed through the skin.

Inhalation:
Vapors may cause irritation, nausea, and headaches. May cause respiratory sensitization responses in susceptible individuals. Symptoms may include tightness of the chest, asthma-like symptoms, respiratory distress.

Ingestion:
Harmful if swallowed. May cause burns to the mouth and upper gastrointestinal tract.

Chronic Health Effects:
Repeated overexposure to polyethylene polyamines (including Diethylene Triamine, Triethylene Tetramine, and Tetraethylene Pentamine) are reported to cause liver and kidney injury in tests on laboratory animals.

SECTION 9 FIRST AID PROCEDURES:

Eye Contact:
Immediately flush eyes thoroughly with water for at least 15 minutes while holding eyelids open. Get immediate medical attention.

Skin Contact:
Immediately flush the affected area of the skin with plenty of water, while removing contaminated clothing or shoes. Follow by thoroughly washing with soap and water. Avoid scrubbing, as this action could increase skin absorption and worsen the effect of chemical contact. Get immediate medical attention. Do not reuse contaminated clothing until properly cleaned. Contaminated leather articles, including shoes, cannot be decontaminated and should be destroyed.

Inhalation:
Remove victim to fresh air. Provide oxygen if breathing is difficult. Give artificial respiration if not breathing. Get immediate medical attention.

Ingestion:
DO NOT induce vomiting. If victim is conscious and alert, dilute by giving water to drink; never give anything by mouth to a drowsy, unconscious, or convulsing person. Get immediate medical attention.

TSCA Status:
All components of this product are listed in the EPA Toxic Substance Control Act Inventory.

SARA Status:
This product does not contain any substances regulated by the SARA Section 313 amendments to RCRA.

Special Notes:
Volatile Organic Compound (V.O.C.) Content as tested in accordance with the Southern California Air Quality Management District Rule 109 (EPA Test Method 24):
441.5 g/l

Date Prepared: 7/10/90 Supercedes: 7/5/89
Document No.: 600008 Prepared by: David Haas
Revision Information:

Abbreviations: NA = Not Applicable NE = Not Established ND = Not Determined
ppm = Parts per Million mg/m3 = Milligrams Per Cubic Meter
C = Ceiling Concentration STEL = Short Term Exposure Limit

MATERIAL SAFETY DATA SHEET

FOR COATINGS, RESINS AND RELATED MATERIALS

Approved by U.S. Department of Labor (Essentially Similar to Form OSHA-20)

MANUFACTURERS SINCE 1901

DOZIER & GAY PAINT COMPANY

MANUFACTURING DIVISION ADDRESS

DOZIER & GAY PAINT COMPANY
2245 N. Main Street
Jacksonville, Florida 32206

Section I

ERGENCY TELEPHONE NO. (904) 354-8251

ORMATION TELEPHONE NO. (904) 354-8251

TE OF PREP February 28, 1986

ODUCT CLASS Flammable - solvent

MANUFACTURER'S CODE IDENTIFICATION 51-026

ADE NAME Xylene (Xylol)

Section II - HAZARDOUS INGREDIENTS

GREDIENT	PERCENT	TLV PPM	TLV mg/M³	LEL	VAPOR PRESSURE
Xylene	100	100		1.0%	10.0

Section III - PHYSICAL DATA

LING RANGE 280-284°F

VAPOR DENSITY 3.7

[x] HEAVIER, [ ] LIGHTER, THAN AIR

PORATION RATE [ ] FASTER, [x] SLOWER, THAN ETHER

PERCENT VOLATILE BY VOLUME 100%

WEIGHT PER GALLON 7.25 pounds

Section IV - FIRE AND EXPLOSION HAZARD DATA

MMABILITY CLASSIFICATION Flammable liquid

FLASH POINT 80°F-TCC

LFL Section II

INGUISHING MEDIA Foam CO_2 or dry chemical

JSUAL FIRE AND EXPLOSION HAZARDS Vapors can form an explosive mixutre with air

SPECIAL FIRE FIGHTING PROCEDURES Self contained breathing apparatus with a full face piece operated in pressure demand or other pressure mode.

Section V - HEALTH HAZARD DATA

HRESHOLD LIMIT VALUE Section II

FFECTS OF OVEREXPOSURE Inhalation. Anesthetic. Irritation of the respiratory tract, acute nervous system depressin characterized by headach, dizziness, stagering gait, confuston, unconsciousness or coma. Skin or eye contact primary irritation.

MERGENCY AND FIRST AID PROCEDURES Vapors: Move to fresh air, insure good breathing, keep warm, call a doctor. Splash: if in eyes, wash with water copiously. Call a doctor. If on skin, wash with water and remove contaminated clothing.

Section VI - REACTIVITY DATA

TABILITY [ ] UNSTABLE [X] STABLE CONDITIONS TO AVOID Heat, Open Flame, Sparks

COMPATABILITY *(Materials to Avoid)* Strong oxidants, alkalis, concentrated oxygen

AZARDOUS DECOMPOSITION PRODUCTS

Carbon Monoxide in case of incomplete combustion

AZARDOUS POLYMERIZATION [ ] MAY OCCUR [X] WILL NOT OCCUR

ONDITIONS TO AVOID

Section VII - SPILL OR LEAK PROCEDURES

EPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Remove all sources of ignition. Avoid breathing vapors. Ventilate spill area. Use absorbent to collect small spills. Use dam or dike to contain spills.

ASTE DISPOSAL METHOD Dispose of in accordance with local, state, and federal regulations pertaining to flammable liquids.

Section VIII - SPECIAL PROTECTION INFORMATION

SPIRATORY PROTECTION In ventilated area use an organic filter mask. In restricted area or closed area use air supplied mask.

NTILATION General or local exhaust ventilation to keep vapors below TLV in section II and LEL in section II

OTECTIVE GLOVES Chemical resistant gloves for repeated or prolonged contact.

E PROTECTION Shield eyes properly against splash.

HER PROTECTIVE EQUIPMENT

Section IX - SPECIAL PRECAUTIONS

ECAUTIONS TO BE TAKEN IN HANDLING AND STORING Do not store above 120°F. Ground all containers when transferring material from one container to another.

L STORAGE CATEGORY

HER PRECAUTIONS Warning: Flammable. Vapor harmful. May cause eye burns. May cause irritation. prolonged or repeated contact of liquid or breathing of vapors or mists may cause delayed and serious injury. Keep away from heat, sparks and open flames. Use only when adequate ventilation. Avoid breathing of vapor or spray mist. Avoid contact with eyes and skin. Do not take internally.

MATERIAL SAFETY DATA SHEET

PPG INDUSTRIES, INC. ONE PPG PLACE PITTSBURGH, PA 15272
24-HOUR EMERGENCY ASSISTANCE: (304) 843-1300

APPROVED BY U.S. DEPT. OF LABOR AS "ESSENTIALLY SIMILAR" TO FORM OSHA-20

EFFECTIVE DATE: DECEMBER 1, 1984 EDITION: 7

CHEMICAL NAME AND SYNONYMS:
1,1,1-TRICHLOROETHANE
METHYLCHLOROFORM
CAS NO. 71-55-6

TRADE NAME:
TRI-ETHANE

CHEMICAL FAMILY:
HALOGENATED HYDROCARBONS

FORMULA:
CH3CCL3

DOT SHIPPING NAME:
TRI-ETHANE

DOT HAZARD CLASS:
SEE COMMENTS

REPORTABLE QUANTITY: N/A

I.D. NUMBER: COMM.

SUBSIDIARY RISK: N/A

SECTION 1 PHYSICAL DATA

BOILING POINT @760MM HG	VAPOR DENSITY (AIR=1)	SPECIFIC GRAVITY (H2O=1)	PH OF SOLUTIONS:
72C	4.54	1.3-1.32@25/25C	6.0 TO 7.5

FREEZING/MELTING POINT	SOLUBILITY (WEIGHT% IN WATER)	BULK DENSITY	VOLUME % VOLAT
-45 C	NEGLIGIBLE	10.8-10.97L/G@25	100

VAPOR PRESSURE:
135 MM HG @ 25 C

EVAPORATION RATE:
(ETHYL ETHER=1): 0.35

HEAT OF SOLUTION:
N/A

APPEARANCE AND ODOR:
CLEAR, COLORLESS LIQUID WITH ETHER-LIKE ODOR

SECTION 2 INGREDIENTS

INGREDIENT:	%	INGREDIENT:	%
1,1,1-TRICHLOROETHANE (STAB.)	100%		

SECTION 3 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT DEG F (METHOD USED)
NONE/DOT REQUIRE.

FLAMMABLE LIMITS IN AIR(% BY VOLUME)
LEL: 7%
UEL: 15%

EXTINGUISHING MEDIA:
WATER, DRY CHEMICALS OR CARBON DIOXIDE

SPECIAL FIRE FIGHTING PROCEDURES:
FIRE FIGHTERS SHOULD WEAR NIOSH/MSHA-APPROVED PRESSURE DEMAND, SELF-CONTAINED BREATHING APPARATUS FOR POSSIBLE EXPOSURE TO HYDROGEN CHLORIDE AND POSSIBLE TRACES OF PHOSGENE.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
VAPORS CONCENTRATED IN A CONFINED OR POORLY VENTILATED AREA CAN BE IGNITED UPON CONTACT WITH A HIGH ENERGY SPARK,FLAME,OR HIGH INTENSITY SOURCE OF HEAT. THIS CAN OCCUR AT CONCENTRATIONS RANGING BETWEEN 7-15% BY VOLUME. DECOMPOSITION OR BURNING CAN PRODUCE HYDROGEN CHLORIDE OR POSSIBLY TRACES OF PHOSGENE.

SECTION 4 HEALTH HAZARD DATA

TOXICITY DATA: SEE REFERENCES 1-7 CLASSIFICATION(POISON,IRRITANT,ETC.)

LC50 INHALATION:
RAT 8,000 PPM/7 HOURS

INHALATION:
SLIGHTLY TOXIC

LD50 DERMAL:
RABBIT >15 G/KG

SKIN:
NOT SIGNIFICANTLY TOXIC

SKIN/EYE IRRITATION:
SEE SECTION 5

SKIN:
MILDLY IRRITATING

EYE:
EYE IRRITANT

LD50 INGESTION:
SEE COMMENTS

INGESTION:
NOT SIGNIFICANTLY TOXIC

FISH LC50(LETHAL CONCENTRATION):
UNKNOWN

AQUATIC:
UNKNOWN

SECTION 5 EFFECTS OF OVEREXPOSURE

THIS SECTION COVERS EFFECTS OF OVEREXPOSURE FOR INHALATION, EYE/SKIN CONTACT, INGESTION AND OTHER TYPES OF OVEREXPOSURE INFORMATION IN THE ORDER OF THE MOST HAZARDOUS AND THE MOST LIKELY ROUTE OF OVEREXPOSURE

PERMISSIBLE EXPOSURE LIMITS:
CURRENT OSHA PERMISSIBLE EXPOSURE LIMIT IS 350 PPM, 8-HOUR TWA (TIME-WEIGHTED AVERAGE); 29CFR 1910.1000

ACGIH: 350 PPM, 8-HOUR TWA (TIME-WEIGHTED AVERAGE); 450 PPM, STEL (15-MINUTE SHORT-TERM EXPOSURE LIMIT).

PPG INTERNAL PERMISSIBLE EXPOSURE LIMIT: 350 PPM, 8-HOUR TWA (TIME-WEIGHTED AVERAGE); 450 PPM, STEL (15-MINUTE SHORT-TERM EXPOSURE LIMIT).

ACUTE

INHALATION: TRI-ETHANE IS PRIMARILY A CENTRAL NERVOUS SYSTEM DEPRESSANT.

SECTION 6 REACTIVITY DATA

STABILITY:
STABLE
CONDITIONS TO AVOID:
AVOID OPEN FLAMES, HOT GLOWING SURFACES OR ELECTRIC ARCS

HAZARDOUS POLYMERIZATION:
WILL NOT OCCUR

CONDITIONS TO AVOID:
NONE

INCOMPATIBILITY (MATERIALS TO AVOID):
AVOID MIXING WITH CAUSTIC SODA, CAUSTIC POTASH, OR OXIDIZING MATERIALS. SHOCK SENSITIVE COMPOUNDS MAY BE FORMED.

HAZARDOUS DECOMPOSITION PRODUCTS:
HYDROGEN CHLORIDE AND POSSIBLY TRACES OF PHOSGENE.

SECTION 7 SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED:
IMMEDIATELY EVACUATE THE AREA AND PROVIDE MAXIMUM VENTILATION. UNPROTECTED PERSONNEL SHOULD MOVE UPWIND OF SPILL. ONLY PERSONNEL EQUIPPED WITH PROPER RESPIRATORY AND SKIN/EYE PROTECTION (SEE SECTION 8) SHOULD BE PERMITTED IN AREA. DIKE AREA TO CONTAIN SPILL. TAKE PRECAUTIONS AS NECESSARY TO PREVENT CONTAMINATION OF GROUND AND SURFACE WATERS. RECOVER SPILLED MATERIAL ON ADSORBENTS, SUCH AS SAWDUST AND VERMICULITE, AND SWEEP INTO CLOSED CONTAINERS FOR DISPOSAL. AFTER ALL VISIBLE TRACES, INCLUDING IGNITABLE VAPORS, HAVE BEEN REMOVED, THOROUGHLY WET VACUUM THE AREA. DO NOT FLUSH TO SEWER. IF AREA OF SPILL IS POROUS, REMOVE AS MUCH CONTMAINATED EARTH AND GRAVEL, ETC. AS NECESSARY AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL.

WASTE DISPOSAL METHOD:
CONTAMINATED SAWDUST, VERMICULITE, OR POROUS SURFACES MUST BE DISPOSED OF IN A PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY. RECOVERED LIQUIDS MAY BE REPROCESSED OR INCINERATED OR MUST BE TREATED IN A PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY. CARE MUST BE TAKEN WHEN USING OR DISPOSING OF CHEMICAL MATERIALS AND/OR THEIR CONTAINERS TO PREVENT ENVIRONMENTAL CONTAMINATION. IT IS YOUR DUTY TO DISPOSE OF THE CHEMICAL MATERIALS AND/OR THEIR CONTAINERS IN ACCORDANCE WITH THE CLEAN AIR ACT, THE CLEAN WATER ACT, THE RESOURCE CONSERVATION AND RECOVERY ACT, AS WELL AS ANY OTHER RELEVANT FEDERAL, STATE, OR LOCAL LAWS/REGULATIONS REGARDING DISPOSAL.

RCRA - HAZARDOUS WASTE NUMBER - U-266

SECTION 8 SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:
USE A HALF OR FULL FACEPIECE ORGANIC VAPOR CHEMICAL CARTRIDGE OR CANISTER RESPIRATOR WHEN CONCENTRATIONS EXCEED PERMISSIBLE LIMITS. USE SELF-

CONTAINED BREATHING APPARATUS (SCBA) OR FULL FACEPIECE AIRLINE RESPIRATOR WITH AUXILIARY SCBA OPERATED IN THE PRESSURE-DEMAND MODE FOR EMERGENCIES AND FOR ALL WORK PERFORMED IN STORAGE VESSELS, POORLY VENTILATED ROOM, AND OTHER CONFINED AREAS. RESPIRATORS MUST BE APPROVED BY NIOSH OR MSHA. THE RESPIRATOR USE LIMITATIONS MADE BY NIOSH/MSHA (9,10) AND BY THE MANUFACTURER MUST BE OBSERVED. RESPIRATORY PROTECTION PROGRAMS MUST BE IN ACCORDANCE WITH 29CFR 1910.134.

VENTILATION(TYPE):
USE LOCAL EXHAUST OR DILUTION VENTILATION AS APPROPRIATE TO CONTROL EXPOSURES TO BELOW PERMISSIBLE LIMITS.

EYE PROTECTION:
SPLASHPROOF GOGGLES

GLOVES:
SEE COMMENTS

OTHER PROTECTIVE EQUIPMENT:
BOOTS, APRONS, OR CHEMICAL SUITS SHOULD BE USED WHEN NECESSARY TO PREVENT SKIN CONTACT. PERSONAL PROTECTIVE CLOTHING AND USE OF EQUIPMENT MUST BE IN ACCORDANCE WITH 29CFR 1910.133 AND 29CFR 1910.132.

SECTION 9 SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN DURING HANDLING AND STORING:

1. DO NOT USE IN POORLY VENTILATED OR CONFINED AREAS WITHOUT PROPER RESPIRATORY PROTECTION (SEE SECTION 8).
2. TRI-ETHANE VAPORS ARE HEAVIER THAN AIR AND WILL COLLECT IN LOW AREAS.
3. KEEP CONTAINER CLOSED WHEN NOT IN USE.
4. STORE ONLY IN CLOSED, PROPERLY LABELED CONTAINERS.
5. LIQUID OXYGEN OR OTHER STRONG OXIDANTS MAY FORM EXPLOSIVE MIXTURES WITH TRI-ETHANE.
6. THIS MATERIAL OR ITS VAPORS WHEN IN CONTACT WITH FLAMES, HOT GLOWING SURFACES, OR ELECTRIC ARCS CAN DECOMPOSE TO FORM HYDROGEN CHLORIDE AND POSSIBLY TRACES OF PHOSGENE.
7. AVOID CONTAMINATION OF WATER SUPPLIES. HANDLING, STORAGE, AND USE PROCEDURES MUST BE CAREFULLY MONITORED TO AVOID SPILLS OR LEAKS. ANY SPILL OR LEAK HAS THE POTENTIAL TO CAUSE UNDERGROUND WATER CONTAMINATION WHICH MAY, IF SUFFICIENTLY SEVERE, RENDER A DRINKING WATER SOURCE UNFIT FOR HUMAN CONSUMPTION. CONTAMINATION THAT DOES OCCUR CANNOT BE EASILY CORRECTED.
8. DO NOT STORE OR STACK ALUMINUM IN CONTACT WITH TRI-ETHANE TO PREVENT POSSIBLE SOLVENT DECOMPOSITION (STACKING CORROSION).
9. CAUTION SHOULD BE TAKEN NOT TO USE IN PRESSURIZED OR TOTALLY ENCLOSED SYSTEM OF ALUMINUM CONSTRUCTION. EXAMPLE: PAIN OR ADHESIVE SPRAY SYSTEM.
10. A CHLORINATED SOLVENT USED AS A FLASHPOINT SUPPRESSANT MUST BE ADDED IN SUFFICIENT QUANTITY OR THE RESULTANT MIXTURE MAY HAVE A FLASHPOINT LOWER THAN THE FLAMMABLE COMPONENT.
11. DO NOT USE CUTTING OR WELDING TORCHES ON EMPTY DRUMS THAT CONTAINED TRI-ETHANE UNLESS PROPERLY PURGED AND CLEANED.

OTHER PRECAUTIONS:

1. DO NOT BREATHE VAPORS. HIGH VAPOR CONCENTRATIONS CAN CAUSE DIZZINESS,

INHALATION CAN CAUSE IRRITATION OF THE RESPIRATORY SYSTEM, DIZZINESS, NAUSEA, LIGHTHEADEDNESS, HEADACHE, LOSS OF COORDINATION AND EQUILIBRIUM, UNCONSCIOUSNESS, POSSIBLE CENTRAL NERVOUS SYSTEM DAMAGE AND EVEN DEATH IN CONFINED OR POORLY VENTILATED AREAS. FATALITIES FOLLOWING SEVERE ACUTE EXPOSURE TO VARIOUS CHLORINATED SOLVENTS HAVE BEEN ATTRIBUTED TO VENTRICULAR FIBRILLATION.

EYE/SKIN: LIQUID SPLASHED IN THE EYE CAN RESULT IN DISCOMFORT, PAIN AND IRRITATION. PROLONGED OR REPEATED CONTACT WITH LIQUID ON THE SKIN CAN CAUSE IRRITATION AND DERMATITIS. THE PROBLEM MAY BE ACCENTUATED BY LIQUID BECOMING TRAPPED AGAINST THE SKIN BY CONTAMINATED CLOTHING AND SHOES, AND SKIN ABSORPTION CAN OCCUR.

INGESTION: SWALLOWING OF THIS MATERIAL MAY RESULT IN IRRITATION OF THE MOUTH AND GI TRACT WITH OTHER EFFECTS AS LISTED ABOVE FOR INHALATION. VOMITING AND SUBSEQUENT ASPIRATION INTO THE LUNGS MAY LEAD TO CHEMICAL PNEUMONIA AND PULMONARY EDEMA WHICH IS A POTENTIALLY FATAL CONDITION.

CHRONIC

TRI-ETHANE HAS BEEN EXTENSIVELY STUDIED FOR CANCER POTENTIAL. THERE IS NO DOCUMENTED EVIDENCE TO SUGGEST THAT TRI-ETHANE CAUSES AN INCREASED CANCER INCIDENCE IN HUMANS OR ANIMALS. THE EPA'S SCIENCE ADVISORY BOARD CONCLUDED THAT THERE IS NO EVIDENCE TO SUGGEST CARCINOGENIC ACTIVITY FOR TRI-ETHANE.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION:
REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

EYE OR SKIN CONTACT:
FLUSH EYES AND SKIN WITH PLENTY OF WATER (SOAP AND WATER FOR SKIN) FOR AT LEAST 15 MINUTES, WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. IF IRRITATION OCCURS, CONSULT A PHYSICIAN. THOROUGHLY CLEAN CONTAMINATED CLOTHING AND SHOES BEFORE REUSE OR DISCARD.

INGESTION:
IF CONSCIOUS, DRINK LARGE QUANTITIES OF WATER. DO NOT INDUCE VOMITING. TAKE IMMEDIATELY TO A HOSPITAL OR PHYSICIAN. IF UNCONSCIOUS, OR IN CONVULSIONS, TAKE IMMEDIATELY TO A HOSPITAL. DO NOT ATTEMPT TO GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

NOTES TO PHYSICIAN INCLUDING ANTIDOTES:
NEVER ADMINISTER ADRENALIN FOLLOWING TRI-ETHANE OVEREXPOSURE. INCREASED SENSITIVITY OF THE HEART TO ADRENALIN MAY BE CAUSED BY OVEREXPOSURE TO TRI-ETHANE.

UNCONSCIOUSNESS, POSSIBLE CENTRAL NERVOUS SYSTEM DAMAGE OR DEATH.
2. USE ONLY WITH ADEQUATE VENTILATION. VENTILATION MUST BE SUFFICIENT TO LIMIT EMPLOYEE EXPOSURE TO TRI-ETHANE BELOW PERMISSIBLE EXPOSURE LIMITS. OBSERVANCE OF LOWER LIMITS (OUTLINED IN SECTION 5) IS ADVISABLE.
3. AVOID CONTACT WITH EYES. WILL CAUSE IRRITATION AND PAIN.
4. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. MAY CAUSE IRRITATION OR DERMATITIS.
5. DO NOT SWALLOW. SWALLOWING MAY CAUSE INJURY OR DEATH.
6. DO NOT EAT, DRINK, OR SMOKE IN WORK AREAS.

REFERENCES:

1. NIOSH REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES, 1975.
2. INDUSTRIAL HYGIENE AND TOXICOLOGY, VOLUME II, SECOND EDITION, F.A.PATTY, 1963.
3. DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, FOURTH EDITION, N.I.SAX, 1975.
4. INDUSTRIAL TOXICOLOGY, HAMILTON AND HARDY, 1974.
5. TOXICITY AND METABOLISMS OF INDUSTRIAL SOLVENTS, BROWNING, 1965.
6. TOXICOLOGY, THE BASIC SCIENCE OF POISONS, CASARETT AND DOULL, 1975.
7. EPA SCIENCE ADVISORY BOARD, SUBCOMMITTEE ON AIRBORNE CARCINOGENS, SEPTEMBER, 1980.
8. ENCYCLOPEDIA OF CHEMICAL TECHNOLOGY, VOLUME 5, THIRD EDITION, KIRK-OTHMER, 1979.
9. NIOSH/OSHA OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS, DHHS (NIOSH) PUBLICATION NOL 81-123, JANUARY, 1981.
10. NIOSH/OSHA POCKET GUIDE TO CHEMICAL HAZARDS, DHEW (NIOSH) PUBLICATION NO. 78-210, SEPTEMBER, 1978.

COMMENTS:
DOT HAZARD CLASS

ONLY REGULATED WHEN SHIPPED BY AIR. DOT SHIPPING NAME IS 1,1,1-TRICHLOROETHANE, DOT HAZARD CLASS IS ORM-A, AND UN NUMBER IS UN2831.

SECTION 4 - HEALTH HAZARD DATA

LD50 INGESTION: RAT 10-12 G/KG
RABBIT, GUINEA PIG 5.6-9.5 G/KG

SECTION 8 - SPECIAL PROTECTION INFORMATION

GLOVES: VITON. FOR LIMITED SERVICE ONLY: POLYVINYL ALCOHOL*, NITRILE, BUTYL, NEOPRENE.
* (DEGRADES IN WATER)

MATERIAL SAFETY DATA SHEET

SECTION I

PRODUCT NAME:	PR-420 Brown, Part A	MSDS IDENTIFICATION NO:	MS2919C00
		DATE OF ISSUE:	11-21-85
DESCRIPTION:	Polyurethane Polymer Compound Solution	PREPARED BY:	MBY
MANUFACTURER:	Products Research & Chemical Corporation 5430 San Fernando Road, P.O. Box 1800, Glendale, CA 91209		
EMERGENCY TELEPHONE:	(818) 240-2060		

SECTION II - HAZARDOUS INGREDIENTS

CHEMICAL NAME	COMMON NAME	CAS NO	OSHA PEL	CALOSHA PEL	ACGIH TLV
Polymethylene polyphenyl isocyanate	Polymeric MDI	9016-87-9	0.02 ppm	0.02 ppm	0.02 ppm
The polymeric MDI contains 4,4'-diphenylmethane diisocyanate monomer (MDI) [CAS 101-68-8]. THE PEL shown is for the monomer.					
1-Methoxy-2-propanol acetate	PM acetate	108-65-6	*	*	*
* The manufacturer recommends a TLV of 100 ppm.					

SECTION III - PHYSICAL AND CHEMICAL CHARACTERISTICS

Boiling Point, °F.:	Unk.	Specific Gravity:	1.15
Vapor Pressure, mm Hg:	Unk.	% Volatiles, by Vol:	40
Vapor Density:	4.60 (PM acetate)	Evaporation Rate:	Unk.
Solubility in Water:	Appreciable.		

SECTION IV - PHYSICAL HAZARD INFORMATION

Flash Point:	116°F (PMCC) Flammable Limits: Unk.
Extinguishing Media:	Foam, CO_2, dry chemical, water spray.
Spec. Fire Fighting Proc:	Use water to cool heat exposed containers. Use air-supplied respirator.
Unusual Fire Hazards:	High temperatures may produce pressure build-up in closed containers.
Stability:	Stable.
Incompatibility:	Strong oxidizing agents, water, amines, strong bases, alcohols.
Decomposition products:	Oxides of carbon and nitrogen and possible traces of HCN.
Hazardous polymerization:	Will not occur.

SECTION V - HEALTH HAZARD INFORMATION

EFFECTS OF OVER-EXPOSURE:

Eyes:	Irritation, watering and possible reversible corneal damage.
Skin:	Local irritation and discoloration. May cause allergic skin rash in sensitized individuals.
Inhalation:	Note: Due to the low volatility of the isocyanate, significant exposure to isocyanate vapors is not expected unless material is overheated or sprayed. Excessive inhalation can produce irritation of the nose, throat and respiratory tract. Excessive and extensive exposure can produce reversible symptoms of bronchitis. Sensitized individuals will develop asthma-like symptoms at low exposure.
Ingestion:	Irritation of stomach and digestive tract.

SECTION VI - EMERGENCY FIRST AID PROCEDURES

Eyes:	Flush with luke-warm water. Consult a physician.
Skin:	Wash with soap and water. If irritation persists, consult a physician.
Inhalation:	Remove to fresh air. If respiratory symptoms are present, consult a physician.
Ingestion:	Do not induce vomiting. Consult a physician.

SECTION VII - SUGGESTED CONTROL PROCEDURES

Ventilation:	General ventilation to maintain vapors below PEL. When spraying, applying in confined areas or other circumstances likely to produce airborne levels of isocyanate and solvent in excess of PEL, use an air-supplied respirator.
Skin Protection:	Solvent-resistant gloves.
Eye Protection:	Goggles or full face shield.

SECTION VIII - SPILL OR LEAKAGE PROCEDURES

Release or Spillage:	Cover with absorbent material, add decontamination solution* and allow to stand for 10 minutes. Collect in container, add additional decontamination solution and keep loosely covered for 48 hours.
Waste Disposal:	EPA No. D001 Hazardous Waste. Dispose of in compliance with Federal and State regulations.

SECTION IX - SPECIAL PRECAUTIONS

Avoid moisture contamination. If moisture contamination is suspected, do not reseal container. Moisture contamination may cause evolution of CO_2.

* Decontamination solution: 5% concentrated ammonia, 2% detergent and 93% water.

The information provided herein is, to the best of the manufacturer's knowledge, current, accurate and complete, based on information reasonably available.

MATERIAL SAFETY DATA SHEET

SECTION I

N

PRODUCT NAME:	PR-420 Brown, Part B	MSDS IDENTIFICATION NO:	MS3106C00
		DATE OF ISSUE:	11-21-85
DESCRIPTION:	Hydrocarbon Resin Compound Solution	PREPARED BY:	MBY
MANUFACTURER:	Products Research & Chemical Corporation 5430 San Fernando Road, P.O. Box 1800, Glendale, CA 91209		
EMERGENCY TELEPHONE:	(818) 240-2060		

SECTION II - HAZARDOUS INGREDIENTS

CHEMICAL NAME	COMMON NAME	CAS NO	OSHA PEL	CALOSHA PEL	ACGIH TLV
1-Methoxy-2-propanol acetate	PM acetate	108-65-6	*	*	*
* The manufacturer recommends a TLV of 100 ppm.					
1-Nitropropane	1-nitropropane	108-03-2	25 ppm	25 ppm	25 ppm
2-Heptanone	methyl n-amyl ketone	110-43-0	100 ppm	50 ppm	50 ppm

The following ingredients are listed as required by 29 CFR 1910.1200 because they appear on the airborne contaminants list. However, in this product they are present in a fully encapsulated form and are therefore not hazardous under normal circumstances.

Silica	silica	7631-86-9	Not est.	20 mppcf	Not est.
Calcium magnesium silicate	talc	14807-96-6	20 mppcf	20 mppcf	2mg/M^3

SECTION III - PHYSICAL AND CHEMICAL CHARACTERISTICS

Boiling Point, °F.:	Unk.	Specific Gravity:	1.17
Vapor Pressure, mm Hg:	Unk.	% Volatiles, by Vol:	84
Vapor Density:	Unk.	Evaporation Rate:	Unk.
Solubility in Water:	Moderate.		

SECTION IV - PHYSICAL HAZARD INFORMATION

Flash Point:	101°F (PMCC) Flammable Limits: Unk.
Extinguishing Media:	Foam, CO_2, dry chemical. water spray.
Spec. Fire Fighting Proc:	Use water to cool heat-exposed containers.
Unusual Fire Hazards:	High temperatures may cause pressure buildup in closed containers.
Stability:	Stable.
Incompatibility:	Strong oxidizing agents; strong alkalis.
Decomposition products:	Oxides of carbon and nitrogen, HCl.
Hazardous polymerization:	Will not occur.

SECTION V - HEALTH HAZARD INFORMATION

EFFECTS OF OVER-EXPOSURE:

Eyes:	Irritation.
Skin:	Irritation.
Inhalation:	Headache; nausea; irritation of mucous membranes; narcosis.
Ingestion:	Moderately toxic.

SECTION VI - EMERGENCY FIRST AID PROCEDURES

Eyes:	Flush with water. If symptoms persist, consult a physician.
Skin:	Wash with soap and water. If symptoms persist, consult a physician.
Inhalation:	Remove to fresh air. If symptoms are present, consult a physician.
Ingestion:	Consult a physician.

SECTION VII - SUGGESTED CONTROL PROCEDURES

Ventilation:	General ventilation to maintain vapors below PEL. When spraying, applying in confined areas or other circumstances likely to produce airborne levels of solvents in excess of PEL, use an air-supplied respirator.
Skin Protection:	Solvent-resistant gloves.
Eye Protection:	Goggles or full face shield.

SECTION VIII - SPILL OR LEAKAGE PROCEDURES

Release or Spillage:	Scoop into container. Clean up residue with 1,1,1-trichloroethane.
Waste Disposal:	EPA No. D001 Hazardous Waste. Dispose of in compliance with Federal and State regulations.

SECTION IX - SPECIAL PRECAUTIONS

None.

The information provided herein is, to the best of the manufacturer's knowledge, current, accurate and complete, based on information reasonably available.

****

MATERIAL SAFETY DATA SHEET *

****

ACETONE

EMERGENCY TELEPHONES:
CHEMTREC: 800-424-9300
MANUFACTURER: Vendor phone # 10
COMPANY RESP.: Emergency phone not noted
LATEST REVISION DATE:

FIRE HAZARDS* scale
HEALTH RISK 1* 4=extr.
FLAMMABILITY 3* 3=high
REACTIVITY 0* 2=mod.
TOXICITY 3 1=slight
*)NFPA 0=insign.

SECTION I: IDENTITY

SYNONYMS & TRADE NAMES [Family]: #)Trade names
2-PROPANONE, beta-KETOPROPANE, DIMETHYL KETONE, DIMETHYLKETAL, KETONE PROPANE, METHYL KETONE, PROPANONE, PYROACETIC ACID, PYROACETIC ETHER, [Aliphatic ketone], DIMETHYLFORMALDEHYDE

FORMULA: CH3COCH3
HAZARD CLASS: Flammable Liquid
MANUF. NAME : Vendor name 10
ADDRESS : Vendor street address 10
Vendor city, state, zip 10

CAS # : 67641
EPA # : U002
NIOSH #: AL3150000
DOT/UN/NA #: 1090
PART #:

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT NAME	CAS #	CONTENTS(%)	OSHA TWA	ACGIH TLV-TWA

SECTION III: PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT (F @ 760 mmHg): 134
VAPOR PRESSURE (mmHg @ 68F): 182
VAPOR DENSITY (air=1): 2
PERCENT VOLATILE BY VOLUME : 100
VISCOSITY (cST @ 0F):
SOLUBILITY VAL.(g/100g H20,68F): 100
SOLUBILITY: miscible with water, miscible with: alcohol, ether
APPEARANCE: liquid, clear
COLOR : colorless
ODOR : pleasant,agreeable, characteristic, acetone,ketone

SPEC.GRAVITY (@68F,water=1): 0.79
MELTING POINT (F): -139
EVAPORATION RATE : 7.70
(Butyl acetate=1)
pH-VALUE:
CONCENTRATION (%/MOL):

SECTION IV: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (F): -1
FLASH POINT METHOD:CC
NFPA FLAMMABILITY RATING:
OSHA FLAMMABILITY CLASS :
EXTINGUISHING MEDIA: water spray, fog or mist, dry chemicals, sand, dolomite etc., DO NOT extinguish fire unless flow can be stopped first., halon, powder, foam or CO2

AUTO IGNITION TEMP.(F):1004
Ignites easily (3)
Flammable liquid - Class IB

EXPLOSION LIMITS -LOWER %: 2.15
-UPPER %:13.30

SPECIAL FIRE FIGHTING PROCEDURES:
Water may be ineffective but use to keep fire-exposed containers cool.
If a leak or spill has not ignited, use water spray to disperse vapors and protect men stopping the leak.
Water spray may be used to flush spills away from exposures and dilute spills to non-flammable mixtures.
Keep run-off water out of sewers & water sources. Dike for water control
Avoid water in straight hose stream: will scatter and spread fire.
Cool containers exposed to flames with water from the side until well after fire is out.
Move container from fire area if it can be done without risk.
Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire.
Use water spray to reduce vapors.
For massive fire in cargo area: use unmanned hose holder or monitor nozzles, if possible. If not: withdraw and let fire burn out.
If water pollution occurs, notify appropriate authorities.

EVACUATION PROCEDURES:
Isolate in all directions if tank car or truck is involved in fire.
Evacuate if fire gets out of control or container exposed to direct fire
Keep unnecessary people away,isolate hazard area and deny entry.
Isolate in all directions if small spill or leak:
Stay upwind and keep out of low areas.

NIOSH RESPIRATOR RECOMMENDATION:
SCBA: Self-contained breathing apparatus.

UNUSUAL FIRE & EXPLOSION HAZARDS:
Makes explosive mixtures with air
Extremely flammable.
May explode in a fire.
May travel considerable distance to source of ignition and flash back.
Vapor explosion and poison hazard indoors, outdoors and in sewers.

SECTION V: REACTIVITY DATA & PHYSICAL HAZARDS

STABILITY: Stable
CONDITIONS TO AVOID: Avoid heat, sparks, flames
REACTIVITY INDEX: Normally stable (0)
HAZARDOUS DECOMPOSITION OR BYPRODUCTS:
Very flammable gases/vapors/fumes of: carbon monoxide (CO), carbon dioxide (CO2)

HAZARDOUS POLYMERIZATION: Will not occur
CONDITIONS TO AVOID: Is not known to polymerize
WATER REACTIVE? NO AIR REACTIVE? NO

INCOMPATIBLE SPECIFIC CHEMICALS (in the Safechem system):
ACTIVATED CARBON, BARIUM HYDROXIDE, BORON TRIFLUORIDE, BROMINE, BROMOFORM, ANTIMONY PENTAFLUORIDE, CHLOROFORM, CHROMIUM OXYCHLORIDE, CHROMIUM TRIOXIDE, DECABORANE, HYDROGEN PEROXIDE, ISOPRENE, METHYL ETHYL KETONE PEROXIDE, NITRIC ACID, OLEUM, PLATINUM, POTASSIUM-tert-BUTOXIDE, POTASSIUM SULFATE, SODIUM HYDROXIDE, SULFUR DICHLORIDE, SULFURIC ACID, TRICHLOROMELAMINE

OTHER INCOMPATIBLE CHEMICALS & MIXTURES: Chloroform + a base, Nitric acid + acetic acid, Fluorine oxide (F2O2), Nitric acid + sulfuric acid, Nitrosyl perchlorate, Nitryl perchlorate (O2NClO4), Permanosulfuric acid, Peroxymonosulfuric acid, Sodium hypobromite (NaOBr), Sulfuric acid + potassium dichromate, Thio-diglycol + hydrogen peroxide, Thiotrithiazyl perchlorate

INCOMPATIBLE CLASSES OF CHEMICALS: Strong oxidizing agent

SECTION VI: HEALTH HAZARD INFORMATION

ROUTES OF ENTRY: inhalation, skin absorption, ingestion, skin and/or eye contact
TARGET ORGANS : central nervous system, eyes, gastro-intestinal tract, respiratory system, lungs, skin
TOXIC DOSE (LD 50): 9750 mg/kg (oral rat)
TOXICITY INDEX : Moderately toxic (3)

PERMISSIBLE EXPOSURE LIMITS:

OSHA PEL:	1000
ACGIH TWA:	750
ACGIH STEL:	1000
NIOSH PEL:	1000
NIOSH IDLH:	20000

CARCINOGENICITY:

NTP?	NO
IARC?	NO
OSHA?	NO

HEALTH WARNINGS:
Gas or vapor is harmful on prolonged exposure or in high concentrations.
Irritant of eyes and mucous membranes.
Narcotic effect.
CNS depressant.
Vapor from this chemical can be hazardous when inhaled.

ACUTE & CHRONIC HEALTH HAZARDS:
Repeated exposure may cause chronic eye irritation.
Defatting,drying and cracking of skin.
Swallowing concentrated chemical may cause severe internal injury.
Central and/or peripheral nervous system damage.

SIGNS AND SYMPTOMS OF EXPOSURE: irritation of eyes and mucous membranes, rhinitis (inflammation of the nasal mucous membranes), upper respiratory irritation, general respiratory distress, unproductive cough, skin irritation, nausea, vomiting, central nervous system depression, drowsiness, dizziness, disorientation, vertigo, mild intoxication (incl. fatigue,lassitude,irritability,headache,nausea),

MEDICAL CONDITIONS GENERALLY AGGREVATED BY EXPOSURE:
Skin disorders and allergies.

EMERGENCY AND FIRST AID PROCEDURES:
EYE CONTACT: Promptly wash eyes w/lots of water while lifting eye lids
Continue to rinse for at least 15 minutes and get medical attention.
SKIN CONTACT: Remove victim from source of contamination.
Promptly wash contaminated skin w/soap or mild detergent and water.
Promptly remove clothing if soaked through and wash as above.
Get medical attention immediately.
INHALATION: Move the exposed person to fresh air at once.
Perform artificial respiration if breathing has stopped.
When breathing is difficult, properly trained personnel may assist affected person by administering 100% oxygen.
Keep the affected person warm and at rest. Get prompt medical attention.
INGESTION: NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS!
Promptly let victim drink lots of water to dilute the swallowed chemical
After the liquid has been swallowed: try to induce vomiting by having affected person touch back of his throat with his finger.
Get medical attention immediately!
NOTE: Keep victim away from heat, sparks and flames!

SECTION VII: PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Ventilate well, stop flow of gas or liquid if possible. Remove ignition sources. Do not allow chemical to enter confined spaces such as sewers due to explosion risk. Sewers designed to preclude formation of explosive concentrations of vapor may be permitted.
Absorb small quant. w/paper towels and evaporate in safe place (fume hood). Allow sufficient time for vapors to completely clear the hood ducts,then burn the paper in a location away from combustible materials
Collect for reclamation or absorb in vermiculite,dry sand or similar mat
Let evaporate. Keep out of confined spaces because of explosion risk.
Clean-up personnel should use respiratory &/or liquid contact protection
Provide ventilation and confine the spill. Do not allow runoff to sewer.

WASTE DISPOSAL:
Incinerate in suitable combustion chamber.
Absorb in vermiculite or dry sand, dispose in licensed special waste.
Confirm disposal procedures w/environmental engineer & local regulations

G E N E R A L

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
Flammable/combustible: Keep away from oxidizers, heat and flames.
May attack some plastics, rubber and coatings.
Keep in cool, dry, ventilated storage and closed containers.
Ground container & transf.equipm. to eliminate static electricity sparks
Flammable liquid storage

OTHER PRECAUTIONS:
Keep away from heat, sparks and open flame
Avoid spilling, skin and eye contact.
Ventilate well, avoid breathing vapors or dust. Use approved respirator if air contamination is above accepted level.
Read and follow manufacturer's recommendations.
Do not use contact lenses.

SECTION VIII: PROTECTION AND CONTROL MEASURES

RESPIRATORY PROTECTION (required above 1000)
UP TO 150 mg/m3:
GMOVc: Gas mask w/org. vapor canister (chin-style)
For higher contamination levels: see PROTECTION DATA section

PROTECTIVE GLOVES:
Butyl rubber or polyvinyl acetate gloves

EYE PROTECTION:
Wear chemical safety goggles where eye exposure is reasonably probable.
Contact lenses should not be worn when working with this chemical!

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
Use engineering controls to reduce air contamination to permissible lev.
Provide eyewash station & safety shower.
Wear appropriate clothing to prevent repeated or prolonged skin contact.
Wear air-supplied mask in confined areas.

HYGIENIC WORK PRACTICES:
Wash at end of each work shift & before eating, smoking & using toilet.
Wash promptly if skin becomes wet.
Promptly remove any clothing that becomes wet or contaminated.
DO NOT SMOKE IN WORK AREA!
Isolate contaminated clothing and wash before reuse.
Use appropriate hand lotion to prevent defatting and cracking of skin.

VENTILATION REQUIREMENTS:
Explosion-proof general and local exhaust ventilation.
Work in fume hood.

SECTION IX: ADDITIONAL INFORMATION

Have the listed data been compared to manufacturer's Data Sheets? NO
NOTE:Use with caution! Data may not reflect manufacturer's recommendations.
Verified and approved for use by: No name noted on
Revised by: No name noted on

GORE
Creative Technologies Worldwide

MATERIAL SAFETY DATA SHEET

W.L. GORE & ASSOCIATES, INC.
P.O. Box 9329
555 Paper Mill Road
Newark, Delaware 19714

TETRA-ETCH®
ETCHANT

MSDS IDENTIFICATION NUMBER	DATE ISSUED	ISSUED BY	EMERGENCY PHONE NUMBER
PMW - 029	*10/02/87* *Revised 4-6-88*	*Bill Hetrick*	*(301) 392-3700* *(302) 738-4880*

I. PRODUCT IDENTIFICATION

CHEMICAL NAME:	CHEMICAL FAMILY:
Sodium Naphthalene/ Ethylene Glycol Dimethyl Ether Complex	*Sodium Aryl Radical*
TRADE NAME:	FORMULA:
TETRA-ETCH® Etchant	*Not Applicable*

II. HAZARDOUS CONSTITUENTS

CONSTITUENT(S)	PERCENT	CAS NUMBER	OSHA PEL (mg/m^3)	ACGIH TLV (mg/m^3)
Ethylene Glycol Dimethyl Ether	*75%*	*110-71-4*	*NONE**	*NONE**
Sodium Naphthalene Complex	*25%*	*113492-05-0*	*NONE***	*NONE***

III. PHYSICAL PROPERTIES

FREEZING POINT: *Not applicable*	VAPOR PRESSURE (mmHg): *48 @ 68°F*
MELTING POINT: *Not applicable*	VAPOR DENSITY (AIR = 1): *3.11*
BOILING POINT: *185°F @ 760mmHg*	SPECIFIC GRAVITY (H_2O = 1): *0.97*
SUBLIMES @: *Not applicable*	SOLUBILITY IN WATER: *Partial*
EVAPORATION RATE: *5.0 (N-Butyl Acetate = 1)*	% VOLATILES BY VOLUME: *75*
APPEARANCE AND ODOR: *Green-Black liquid, odor of naphthalene and ether*	

*The manufacturer of this material recommends an exposure limit of 5ppm (TWA). W.L. Gore & Associates, Inc. has adopted a more conservative limit of 1ppm TWA, over 8 hours with a STEL of 5ppm, for 30 minutes separated by 1 hour.

**While there is no TLV or PEL for the complex, OSHA and ACGIH have a PEL and TLV of 50mg/m^3 or 10ppm for naphthalene and STEL of 15ppm (ACGIH).

IV. FIRE EXPLOSION AND REACTIVITY INFORMATION

FLASH POINT (WITH TEST METHOD)	FLAMMABLE (EXPLOSIVE) LIMITS V/V%
The Flashpoint for this product has not been determined. *34° Cleveland Open Cup (for solvent only)*	LEL: *1.8%* UEL: *Unknown*

EXTINGUISHING MEDIA	*Dry chemical — Preferably with a nitrogen propellant as in some types* of Low Temperature Extinguishers.
SPECIAL FIREFIGHTING PROCEDURES	*Use a positive pressure supplied air respirator or a self contained breathing apparatus.*
UNUSUAL FIRE AND EXPLOSION HAZARDS	*This material ignites readily and burns vigorously.*
GENERAL REACTIVITY	*Reactive with moisture and halogenated compounds. Hazardous polymerization will not occur.*
INCOMPATIBILITY (MATERIALS TO AVOID)	*Oxidizing materials*
HAZARDOUS DECOMPOSITION PRODUCTS	*Reacts with water to form caustic soda, naphthalene, small amounts of hydrogen and other polycyclic compounds.*

V. HEALTH HAZARD INFORMATION

PRIMARY ROUTE(S) OF EXPOSURE	INHALATION: *This material is very volatile and inhalation of vapor can cause excessive exposure if proper ventilation is not used.*
	INGESTION: *Not a likely route of exposure.*
	SKIN: *This material can be absorbed through the skin and skin contact must be avoided to prevent overexposure.*
	EYES: *Injury may occur if splash occurs, especially during can opening; wear eye protection.*
TOXICITY	*This product is toxic and corrosive and should be handled with proper ventilation and safety equipment.*

EFFECTS OF OVEREXPOSURE	ACUTE: *Inhalation of vapor causes dizziness, drowsiness, anesthesia, headache, eye irritation and nausea. Skin or eye contact will cause severe irritation and possible caustic burns. Material can be absorbed through the skin.*
	CHRONIC: *Recent studies have shown that the glycol dimethyl ether used in this product causes reproductive toxicity in mice such as testicular atrophy, teratogenic effects and embryo toxicity.*
CARCINOGENIC REFERENCES	*NONE*
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE	*Certain rare individuals may show a hypersensitivity to naphthalene. Because of the teratogenic effects in mice of the glycol ether solvent, exposure of pregnant females should be minimized.*

VI. EMERGENCY AND FIRST AID PROCEDURES	
INHALATION	*If exposure occurs, remove affected individual to fresh air. If breathing stops, give artificial respiration and seek medical attention immediately.*
INGESTION	*Contact physician immediately. Product will react with water in the body to form caustic soda.*
SKIN	*Flush with water immediately; wash thoroughly with soap and water, remove any contaminated clothing. If burning sensation persists, see physician immediately.*
EYES	*Immediately flush with water for at least 15 minutes, contact a physician immediately.*

VII. INDUSTRIAL HYGIENE CONTROL MEASURES		
VENTILATION	*Adequate ventilation such as a fume hood or local exhaust is essential.*	
RESPIRATORY PROTECTION	*Use only NIOSH approved respirator or supplied air breathing apparatus. Chemical respirators should be fitted with organic vapor cartridges.*	
PROTECTIVE GLOVES	*For immersion — use butyl rubber. For splash protection — use neoprene or polyethylene.*	
EYE PROTECTION	*Chemical splash safety goggles or face shield to eliminate the possibility of eye contact if splash occurs.*	
OTHER PROTECTIVE EQUIPMENT	*Neoprene or polyethylene apron recommended.*	
ENVIRONMENTAL RECOMMENDED MONITORING PROCEDURES	ENVIRONMENTAL SURVEILLANCE: *Air Monitoring for naphthalene and ether*	MEDICAL SURVEILLANCE: *Not applicable*

VIII. ENVIRONMENTAL PROTECTION INFORMATION	
STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED	*Dike and cover with a mineral based flammable liquid adsorbent such as Safestep (Product of Andesite of California, Inc.) (Note: Be sure there are no ignition sources present.) This material is also caustic. Using non-spark tools, transfer material into a polypropylene or polyethylene drum and dispose of according to federal, state, and local regulations.*
WASTE DISPOSAL METHOD	*Dispose of liquid and solids in accordance with all federal, state and local regulations.*
ENVIRONMENTAL HAZARDS	*This material may be hazardous to the environment. During handling, use and disposal, avoid contamination of soil, drains and water.*

IX. SPECIAL PRECAUTIONS

HANDLING PRECAUTIONS	*Wear gloves and goggles when opening; open carefully to gently release any built up pressure. Follow procedures for flammable materials. Avoid long exposure to the atmosphere. See Storage Precautions.*
STORAGE PRECAUTIONS	*Store below 32°F for best product performance and stability. Allow it to reach room temperature prior to use. Analyze for peroxide formation if material is stored over 6 months.*

X. DOT SHIPPING REQUIREMENTS

SHIPPING NAME	TETRA-ETCH® ETCHANT	IDENTIFICATION NUMBER UN 2924
HAZARD CLASS	Flammable, Corrosive Liquid NOS	LABEL(S) REQUIRED Flammable, Corrosive

ADDITIONAL INFORMATION

PRODUCT HAZARD WARNING LABEL
TETRA-ETCH® ETCHANT

WARNING: FLAMMABLE — Keep away from heat, sparks and open flames. Use with **ADEQUATE VENTILATION.** Avoid breathing vapor. **HARMFUL IF SWALLOWED** — Contains caustic materials; call a physician. Wear safety goggles and rubber gloves when opening and using. **IN CASE OF EYE CONTACT** flush with water; call a physician. **IN CASE OF SKIN CONTACT** rinse with water then wash with soap and water. **OPEN CAN CAREFULLY.** Pressure may build up during storage or when shaking up the can's contents. Allow the pressure to escape slowly before completely opening the can. Pierce the inner seal with a small, pointed tool to vent pressure.

WARNING: TETRA-ETCH® etchant contains a glycol ether which has been shown to have caused reproductive toxicity in mice. For more information contact W.L. Gore and Associates, Inc.

STORE BELOW 32°F.

DISCLAIMER STATEMENT: "The data provided in this document are based upon tests and experience by W.L. Gore & Associates, Inc. Reasonable care has been taken in the preparation of this information. W.L. Gore & Associates, Inc. believes the data to be reliable. These data are supplied for illustration and information purposes only. **W.L. GORE & ASSOCIATES, INC. MAKES NO WARRANTIES OR REPRESENTATIONS AND ASSUMES NO RESPONSIBILITY AS TO THE ACCURACY OR SUITABILITY OF THIS INFORMATION FOR ANY PURCHASER'S USE OR FOR ANY CONSEQUENCE OF ITS USE."**

REVISION DATA AND COMMENTS

2-8-88 — Disclaimer Statement Added.
4-6-88 — Update CAS no for Sodium Naphthalene Complex.

Section 313 Supplier Notification for
TETRA-ETCH® ETCHANT
This product contains chemical mixtures which are subject to reporting requirements of Section 313 of Title III and of 40 CFR 372.

CAS #	CHEMICAL NAME	PERCENT BY WEIGHT
110-71-4	Glycol Ether	≤ 75%
113492-05-0	Sodium Naphthalene Complex	≤ 25%

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MATERIAL SAFETY DATA SHEET

Shell

97002 (REV 1-83)

MSDS NUMBER ▶ 7,750-3 PAGE 1 OF 4

SECTION I	NAME		
PRODUCT ▶	Shell Toluene		
CHEMICAL/ SYNONYMS ▶	Toluol; Methyl Benzene		
CHEMICAL FAMILY ▶	Aromatic Hydrocarbon		
SHELL CODE ▶	83380	C.A.S. NUMBER ▶	108-88-3

24 HOUR EMERGENCY ASSISTANCE

SHELL 713-473-9461
CHEMTREC 800-424-9300

HAZARD RATING
LEAST 0 ▶ SLIGHT 1 ▶ MODERATE 2 ▶ HIGH 3 ▶ EXTREME 4

HEALTH	2
FIRE	3
REACTIVITY	0

SECTION II INGREDIENTS

COMPOSITION	%	TOXICITY DATA
Toluene	100	Oral LD_{50} (rat) ~ 7.0 g/kg Dermal LD_{50} (rbt) = 14 g/kg Inh LC_{50} (rat) = 5,320 ppm (4 hr)
Benzene ..... 50 ppm		

SECTION III HEALTH INFORMATION

Acute Toxicity: Overexposure can lead to central nervous system depression producing such effects as headache, dizziness, nausea, and loss of consciousness.

Eye Contact: Short-term liquid or vapor contact may result in slight eye irritation. Prolonged and repeated contact may be more irritating.

Skin Contact: Prolonged and repeated liquid contact can cause defatting and drying of the skin which may result in skin irritation and dermatitis.

Inhalation: High concentrations or prolonged exposure to lower concentrations may be slightly irritating to mucous membranes.

Ingestion: Liquid ingestion may result in vomiting; aspiration (breathing) of vomitus into the lungs must be avoided as even small quantities in the lungs may result in chemical pneumonitis and pulmonary edema/hemorrhage.

SECTION IV OCCUPATIONAL EXPOSURE LIMITS

ACGIH-TLV/TWA = 100 ppm (skin)
-TLV/STEL = 150 ppm (skin)
OSHA-PEL/TWA = 200 ppm
-PEL/Ceiling = 300 ppm

SECTION VIII REACTIVITY

STABILITY ▶ [ ] UNSTABLE [X] STABLE

HAZARDOUS POLYMERIZATION ▶ [ ] MAY OCCUR [X] WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID

Avoid heat, sparks, open flames and contact with strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide and unidentified organic compounds may be formed during combustion.

SECTION IX EMPLOYEE PROTECTION

RESPIRATORY PROTECTION

Use a NIOSH-approved respirator as required to prevent overexposure. In accord with 29 CFR 1910.134, use either an atmosphere-supplying respirator or an air-purifying respirator for organic vapors.

PROTECTIVE CLOTHING

Wear impervious gloves and protective clothing as required to prevent skin contact. Wear chemical goggles to prevent eye contact.

ADDITIONAL PROTECTIVE MEASURES

Use explosion-proof ventilation as required to control vapor concentrations.

SECTION X ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES

WARNING. Flammable. Eliminate all ignition sources. Handling equipment must be grounded to prevent sparking.
Large spills: Evacuate the hazard area of unprotected personnel. Wear appropriate respirator and protective clothing. Shut off source of leak only if safe to do so. Dike and contain. If vapor cloud forms, water fog may be used to suppress; contain run-off. Remove with vacuum trucks or pump to storage/salvage vessels. Soak up residue with an absorbent such as clay, sand or other suitable material; place in non-leaking containers for proper disposal. Flush area with water to remove trace residue; dispose of flush solutions as above.
Small spills: take up with an absorbent material and place in non-leaking containers; seal tightly for proper disposal.

WASTE DISPOSAL

Place in a disposal facility approved under RCRA regulations for hazardous waste (See Sec. XIII). Use non-leaking containers, seal tightly and label properly.

ENVIRONMENTAL HAZARDS

This product is designated as a hazardous substance under the Clean Water Act. KEEP OUT OF SURFACE WATERS OR SEWERS ENTERING OR LEADING TO SURFACE WATERS. (See Section XIII).

MATERIAL SAFETY DATA SHEET

97005 (REV. 11-84)

SECTION XI SPECIAL PRECAUTIONS

WARNING. Flammable Liquid.
Keep away from heat, sparks and open flames. Keep containers tightly closed. Store away from strong oxidizing agents in a cool, dry place with adequate explosion-proof ventilation. Ground equipment to prevent accumulation of static charge. If pouring or transferring materials, containers must be bonded and grounded.

Do NOT weld, heat or drill on or near container; even emptied containers can contain explosive vapors.

Minimize skin contact. Wash with soap and water before eating, drinking, smoking or using toilet facilities. Launder contaminated clothing before reuse. Properly dispose of contaminated leather articles, including shoes, that cannot be decontaminated.

SECTION XII TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION

[X] FLAMMABLE LIQUID	[ ] COMBUSTIBLE LIQUID	[ ] OXIDIZING MATERIAL	[ ] NON-FLAMMABLE GAS
[ ] FLAMMABLE SOLID	[ ] POISON,CLASS A	[ ] CORROSIVE MATERIAL	[ ] NOT HAZARDOUS BY D.O.T. REGULATIONS
[ ] FLAMMABLE GAS	[ ] POISON,CLASS B	[ ] IRRITATING MATERIAL	[ ] OTHER-Specify below

D.O.T. PROPER SHIPPING NAME

Toluene

OTHER REQUIREMENTS

D.O.T. ID.# = UN1294. Guide Sheet 27. RQ Toluene (1000 lb). Also see Sec. XIII, Clean Water Act.

SECTION XIII SUPPLEMENTARY HEALTH/REGULATORY INFORMATION

EPA - Clean Water Act (CWA)
This product is designated as a hazardous substance under Section 311 of the Clean Water Act. Spills entering (a) surface waters or (b) any water-courses or sewers entering/leading to surface waters MUST be reported immediately to the National Response Center, 800-424-8802. The reportable quantity for toluene is 1000 lb (137 gal).

EPA - Resource Conservation and Recovery Act (RCRA) Regulations
This product has been designated by the EPA (RCRA 40 CFR 261.33) as a hazardous waste if it is spilled, discarded or intended to be discarded as is. The EPA hazardous waste number for toluene is U220.

BE SAFE
READ OUR PRODUCT SAFETY INFORMATION ... AND PASS IT ON
[PRODUCT LIABILITY LAW REQUIRES IT]

John P Lepori
Manager

SHELL OIL COMPANY
PRODUCT SAFETY AND COMPLIANCE
P.O. BOX 4320
HOUSTON,TEXAS 77210
(713) 241-4819

DATE PREPARED
February 10, 1982

UNION CARBIDE

MATERIAL SAFETY DATA SHEET

EFFECTIVE DATE: MARCH 1, 1986

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

PRODUCT NAME:	ISOPROPANOL, ANHYDROUS		
CHEMICAL NAME:	Isopropyl Alcohol	CHEMICAL FAMILY:	Alcohols
FORMULA:	$(CH_3)_2CHOH$	MOLECULAR WEIGHT:	60.10
SYNONYMS:	2-propanol; dimethyl carbinol		
DEPARTMENT OF TRANSPORTATION	Hazard Classification Shipping Name	Flammable Liquid Isopropanol	
CAS # 67-63-0	CAS NAME	2-Propanol	

BOILING POINT, 760 mm Hg	82.26°C (180.07°F)	FREEZING POINT	-88.5°C (-127.3°F)
SPECIFIC GRAVITY (H_2O = 1)	0.7864 at 20/20°C	VAPOR PRESSURE at 20°C	33 mm Hg
VAPOR DENSITY (air = 1)	2.07	SOLUBILITY IN WATER, % by wt.	Complete at 20°C
PERCENT VOLATILES BY VOLUME	100	EVAPORATION RATE (Butyl Acetate = 1)	2.88
APPEARANCE AND ODOR	Colorless liquid; characteristic odor		

MATERIAL	%	TLV	HAZARD
Isopropanol	~100	400 ppm	Eye irritant; Flammable

FLASH POINT	53°F, Tag Closed Cup, ASTM D 56; 63°F, Tag Open Cup, ASTM D 1310			
FLAMMABLE LIMITS IN AIR, % by volume	LOWER	2.0	UPPER	12.7 at 200°F
EXTINGUISHING MEDIA	Apply alcohol-type or all-purpose-type foams by manufacturers' recommended techniques for large fires; carbon dioxide or dry chemical media for small fires.			
SPECIAL FIRE FIGHTING PROCEDURES	Use self-contained breathing apparatus and protective clothing.			
UNUSUAL FIRE AND EXPLOSION HAZARDS	Vapors form from this product and may travel or be moved by air currents and ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equip., static discharges, or other ignition sources at locations distant from handling point.			

STABILITY			
UNSTABLE	STABLE	CONDITIONS TO AVOID	Heat; sparks; flame
	X		

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

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

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

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

PROTECTIVE GLOVES	Butyl	EYE PROTECTION	Monogoggles
OTHER PROTECTIVE EQUIPMENT	Eye bath; safety shower		

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep away from heat, sparks, and flame. Avoid contact with eyes. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

FOR INDUSTRY USE ONLY

OTHER PRECAUTIONS

At very low concentrations in water (~10 ppm), isopropanol is readily biodegradable in a wastewater treatment plant.

[redacted]

400 ppm, ACGIH 1985-6; OSHA 29 CFR, para. 1910.1000, Table Z-1

[redacted]

SWALLOWING	Slightly toxic. Ingestion of a large quantity may cause drowsiness and loss of consciousness. Stomach cramps, pain, nausea, vomiting, and diarrhea may also occur.
SKIN ABSORPTION	No evidence of adverse effects from available information.
INHALATION	Low concentrations may cause mild irritation of eyes, nose, and throat. Concentrations above the TLV may result in headache and drowsiness.
SKIN CONTACT	Prolonged contact may cause drying and cracking of skin.
EYE CONTACT	Causes slight to moderate irritation, with possible corneal injury.

[redacted]

No evidence of adverse effects from available information.

[redacted]

None currently known.

[redacted]

SWALLOWING	Give two glasses of water and induce vomiting. If a significant quantity has been swallowed, get medical attention promptly.
SKIN	Remove contaminated clothing and flush skin with water.
INHALATION	Remove to fresh air. If breathing stops, give artificial respiration and get medical attention as soon as possible.
EYES	Flush eyes immediately with large quantities of water. Get medical attention.

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

UNION CARBIDE

MATERIAL SAFETY DATA SHEET

EFFECTIVE DATE: APRIL 1, 1985

I. IDENTIFICATION

PRODUCT NAME:	METHYL ETHYL KETONE		
CHEMICAL NAME:		CHEMICAL FAMILY:	Ketone
FORMULA:	$CH_3COC_2H_5$	MOLECULAR WEIGHT:	72.10
SYNONYMS:	2-Butanone		
DEPARTMENT OF TRANSPORTATION	Hazard Classification Shipping Name	Flammable Liquid Methyl Ethyl Ketone	
CAS # 78-93-3	CAS NAME	2-Butanone	

II. PHYSICAL DATA

BOILING POINT, 760 mm Hg	79.6° C (175.3° F)	FREEZING POINT	-86.6°C -(123.9°F)
SPECIFIC GRAVITY (H_2O = 1)	0.8060 at 20/20°C	VAPOR PRESSURE at 20°C.	71 mm Hg
VAPOR DENSITY (air = 1)	2.49	SOLUBILITY IN WATER, % by wt.	at 20°C 24
PERCENT VOLATILES BY VOLUME	100	EVAPORATION RATE (Butyl Acetate = 1)	6.31
APPEARANCE AND ODOR	Clear liquid; nonresidual odor.		

III. INGREDIENTS

MATERIAL	%	TLV	HAZARD
Methyl Ethyl Ketone	100	200 ppm	Irritant; Harmful If Inhaled.

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	21°F, Tag Closed Cup ASTM, D56; 22°F, Tag Open Cup ASTM, D1310			
FLAMMABLE LIMITS IN AIR, % by volume	LOWER	1.8	UPPER	10.1
EXTINGUISHING MEDIA	Use water spray, carbon dioxide, dry chemical, or alcohol-type foam applied by manufacturers recommended techniques.			
SPECIAL FIRE FIGHTING PROCEDURES	Use self-contained breathing apparatus and protective clothing. Cool adjacent containers with water spray.			
UNUSUAL FIRE AND EXPLOSION HAZARDS	Vapors form from this product and may travel or move by air currents and ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equip., static discharges, or other ignition sources at locations distant from handling point.			

EMERGENCY PHONE NUMBER - 304/744-3437 - This number is available days, nights, weekends, and holidays.

200 ppm; ACGIH, 1984-5; and OSHA CFR 29, para 1910.1000.

SWALLOWING	Moderately toxic; may cause nausea, vomiting, and diarrhea.
SKIN ABSORPTION	No evidence of adverse effects from available information.
INHALATION	Concentrations of 100-300 ppm cause nose and throat irritation. Higher concentrations cause more severe irritation, headache, nausea, drowsiness, dizziness, and incoordination.
SKIN CONTACT	Prolonged exposure to liquid or to vapors at concentrations greater than the TLV cause moderate irritation.
EYE CONTACT	Liquid causes severe irritation. Vapors cause slight to moderate irritation, depending on the concentration.

Long-term repeated exposures to high concentrations of vapor may result in central nervous system depression and narcosis.

None currently known.

SWALLOWING	Do not induce vomiting. Call a physician.
SKIN	Remove contaminated clothing and flush skin with water.
INHALATION	Remove to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
EYES	Immediately flush with water for at least 15 minutes. Seek medical attention.

NOTES TO PHYSICIAN

Aspirated methyl ethyl ketone may cause severe lung damage and present a significant hazard. Stomach contents should be evacuated quickly in a manner which avoids aspiration. Otherwise, treatment is directed at the control of symptoms and clinical condition. There is no specific antidote.

REACTIVITY DATA

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

INCOMPATIBILITY (materials to avoid)	Avoid alkaline materials, mineral acids, and halogens.
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS	Burning can produce carbon monoxide and/or carbon dioxide.

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

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

SPECIAL PROTECTION INFORMATION

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

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

SPECIAL PRECAUTION INFORMATION

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

FOR INDUSTRY USE ONLY

OTHER PRECAUTIONS