

# ETHYL CORPORATION

INTER-OFFICE

PLAINTIFF'S EXHIBIT

ETCO-774

To : W. C. Strader

Address : BRP

FROM: T. R. Robinson, M.D.

Address: Baton Rouge  
Plant

SUBJECT : I. H. Survey of MASC-Toluene

DATE: Oct. 13, 1975

The attached reports from J. D. Watts (4/22/75 and 10/8/75) concerning the methyl aluminum sesquichloride (MASC) blending with toluene are part of the comprehensive I. H. Survey. The MASC-toluene operation appears to be satisfactory from a health hazard standpoint (but note recommendations to use impervious gloves in unloading toluene). No further studies of this operation are planned at present.

*T. Robinson, M.D.*

TRR:sp

Attachments

cc: ✓ S. A. D'Armond  
S. D. Notsinger

cc: (without attachments)  
H. M. Taylor  
J. D. Watts

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# ETHYL CORPORATION

## INTER-OFFICE

|         |                               |         |                |
|---------|-------------------------------|---------|----------------|
| To      | H.M. Taylor                   | ADDRESS | BRT            |
| FROM    | J.D. Watts                    | ADDRESS | BRT            |
| SUBJECT | MASC Toluene Blender Sampling | DATE    | April 22, 1975 |

### Method

In documenting the potential exposures of employees in this work area to certain chemical contaminants, specific sites were selected for environmental type sampling. The airborne levels found were compared with the standards set by OSHA or the ACGIH.

### Description of Process

MASC toluene is a chemical compound which serves as a catalyst in the production of tetra-methyl lead (TML). Methyl aluminum sesquichloride (MASC) is mixed with toluene at a blending operation located in the extreme north part of the plant to form a 11.6% blend. On the average, two tank cars of this compound (40,000 gallons) is brought up to the TEL area by rail every wekk.

The blending operation is done only on the "A" shift and usually two to three times per week. Two TEL operators and two maintenance employees are potentially exposed. Since the MASC compound is pyrophoric in nature, personal protection such as aluminum-asbestos suits and hoods are afforded the maintenance men during the hook-up and disconnection of the MASC car.

The toluene is metered into the designated blend car and weigh tanks are utilized in adding the MASC. Approximately 15,000 pounds of MASC and 105,000 pounds (15,000 gallons) of toluene are used in making the proper blend.

The toluene tank cars are bottom unloaded and usually the valves on the connections are leaking. The blend car is top loaded. The operation begins at 6:30 a.m. and takes 5-6 hours to make the proper blend. A quality control sample is also collected in a small 2 ounce bottle.

### Employee Time in Area

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The approximate time allotment of either or both employees is as follows:

|                                  |        |
|----------------------------------|--------|
| Metering station (tank car spot) | 25-30% |
| MASC car                         | 10%    |
| Blender shack                    | 55%    |

# Results

## MASC Toluene Blender

| <u>Date</u>                    | <u>Chemical Component</u>          | <u>Concentration (ppm)</u> | <u>Sample Time</u> | <u>Location</u>                                                   |
|--------------------------------|------------------------------------|----------------------------|--------------------|-------------------------------------------------------------------|
| 2/5/75                         | Inorg Pb                           | 0.002 mg/m <sup>3</sup>    | 244 min.           | Blender shack area                                                |
| cloudy, humid<br>60°F, SW wind | Org Pb                             | 0.002 mg/m <sup>3</sup>    |                    |                                                                   |
|                                | propane                            | < 0.08                     | 242 min.           | 2nd floor                                                         |
|                                | CH <sub>3</sub> Cl                 | 0.08                       |                    | blender shack                                                     |
|                                | VCl                                | < 0.06                     |                    |                                                                   |
|                                | CH <sub>3</sub> CH <sub>2</sub> Cl | 0.06                       |                    |                                                                   |
|                                | methylene chloride                 | 18.6                       |                    |                                                                   |
|                                | propane                            | < 0.08                     | 247 min.           | Tank car spot                                                     |
|                                | CH <sub>3</sub> Cl                 | 0.07                       |                    |                                                                   |
|                                | VCl                                | 0.08                       |                    |                                                                   |
|                                | Toluene                            | 17.9                       |                    |                                                                   |
| 2/6/75                         | light HC                           | 0.12 mg/m <sup>3</sup>     | 287 min.           | Tank car spot                                                     |
| cloudy-PC, 46°F                | propane                            | < 0.07                     |                    |                                                                   |
| NW wind                        | CH <sub>3</sub> Cl                 | < 0.06                     |                    |                                                                   |
|                                | VCl                                | < 0.05                     |                    |                                                                   |
|                                | toluene                            | 16.0                       |                    |                                                                   |
| 3/27/75                        | propane                            | 0.28                       | 57 min.            | Tank car spot                                                     |
| clear, 64°F                    | CH <sub>3</sub> Cl                 | 0.13                       |                    |                                                                   |
| SE wind                        | CH <sub>3</sub> CH <sub>2</sub> Cl | 12.5                       |                    |                                                                   |
|                                | Toluene                            | 1.55                       |                    |                                                                   |
|                                | propane                            | 0.11                       | 165 min.           | Blender shack                                                     |
|                                | CH <sub>3</sub> Cl                 | 0.05                       |                    |                                                                   |
|                                | VCl                                | 0.02                       |                    |                                                                   |
|                                | CH <sub>3</sub> CH <sub>2</sub> Cl | 5.8                        |                    |                                                                   |
|                                | Toluene                            | 0.4                        |                    |                                                                   |
|                                | CH <sub>3</sub> CH <sub>2</sub> Cl | 2.6                        | 22 min.            | Personal Samp.                                                    |
|                                | Toluene                            | 5.8                        |                    | while dis-<br>connecting tank<br>car and<br>catching QC<br>sample |

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### Observations

The field sampling results indicate that chemical components present are well within the proper standards, such as 100 ppm for toluene. Therefore, there exists no real health problem during this operational procedure. Both operators seem to be taking the proper precautions, such as wearing the proper protective equipment (goggles and gloves) when disconnecting the toluene car. However, I would recommend the use of impervious type (neoprene or vinyl coated) gloves instead of the cloth gloves being used now due to possible toluene contact with the skin. I feel that this operation should be monitored again in the summer months to see if the toluene levels increase due to a more rapid volatilization.

*J. David Watts*  
J. David Watts  
Industrial Hygienist

JDW:daw

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U.S. DEPARTMENT OF LABOR  
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

Supersedes issue of 1/2

# MATERIAL SAFETY DATA SHEET

## SECTION I

|                                                                                           |                                          |                                                                  |
|-------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------------|
| MANUFACTURER'S NAME<br>EXXON COMPANY, U.S.A. (A Division of Exxon Corporation)            |                                          | EMERGENCY TELEPHONE NO. A.C.<br>Day 221-3424; Night 668-70622-17 |
| ADDRESS (Number, Street, City, State and ZIP Code)<br>P. O. Box 2180 Houston, Texas 77001 |                                          |                                                                  |
| CHEMICAL NAME AND SYNONYMS<br>Aromatic Petroleum Solvent                                  | TRADE NAME AND SYNONYMS<br>TOLUENE       |                                                                  |
| CHEMICAL FAMILY<br>Petroleum Hydrocarbon                                                  | FORMULA<br>C <sub>7</sub> H <sub>8</sub> |                                                                  |

## SECTION II HAZARDOUS INGREDIENTS

| PAINTS, PRESERVATIVES, & SOLVENTS                     | %   | TLV (Units) | ALLOYS AND METALLIC COATINGS           | % | TLV (Units) |
|-------------------------------------------------------|-----|-------------|----------------------------------------|---|-------------|
| PIGMENTS                                              |     | n.a.        | BASE METAL                             |   | n.a.        |
| CATALYST                                              |     | n.a.        | ALLOYS                                 |   | n.a.        |
| VEHICLE                                               |     | n.a.        | METALLIC COATINGS                      |   | n.a.        |
| SOLVENTS                                              | 100 | 100 ppm     | FILLER METAL PLUS COATING OR CORE FLUX |   | n.a.        |
| ADDITIVES                                             |     | n.a.        | OTHERS                                 |   |             |
| OTHERS                                                |     |             |                                        |   |             |
| HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES |     |             |                                        | % | TLV (Units) |
|                                                       |     |             |                                        |   |             |
|                                                       |     |             |                                        |   |             |
|                                                       |     |             |                                        |   |             |
|                                                       |     |             |                                        |   |             |

## SECTION III PHYSICAL DATA

|                                                                       |            |                                           |       |
|-----------------------------------------------------------------------|------------|-------------------------------------------|-------|
| BOILING POINT (°F)<br>IBP - FBP                                       | 230-232    | SPECIFIC GRAVITY (H <sub>2</sub> O=1)     | 0.872 |
| VAPOR PRESSURE (mm Hg.)<br>@ 20°C                                     | 38         | PERCENT VOLATILE BY VOLUME (%)            | 100   |
| VAPOR DENSITY (AIR =1)                                                | 4.5        | EVAPORATION RATE<br>(n-Butyl Acetate = 1) | 1.5   |
| SOLUBILITY IN WATER                                                   | Negligible |                                           |       |
| APPEARANCE AND COLOR<br>Water-white color. Aromatic hydrocarbon odor. |            |                                           |       |

## SECTION IV FIRE AND EXPLOSION HAZARD DATA

|                                                                                           |                  |          |          |
|-------------------------------------------------------------------------------------------|------------------|----------|----------|
| FLASH POINT (Method used)<br>Tag Closed Cup 45°F                                          | FLAMMABLE LIMITS | Lel 1.2% | Uel 7.0% |
| EXTINGUISHING MEDIA<br>Foam, dry chemical, CO <sub>2</sub> , water spray or fog.          |                  |          |          |
| SPECIAL FIRE FIGHTING PROCEDURES<br>Use air-supplied rescue equipment for enclosed areas. |                  |          |          |
| Cool exposed containers with water.                                                       |                  |          |          |
| UNUSUAL FIRE AND EXPLOSION HAZARDS<br>Do not store or mix with strong oxidants.           |                  |          |          |
| Flammable liquid                                                                          |                  |          |          |

n.a. = not applicable

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## SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE  
100 ppm for 8-hour working day.

## EFFECTS OF OVEREXPOSURE

Inhalation of high vapor concentrations may have results ranging from mild depression to convulsions and loss of consciousness.

## EMERGENCY AND FIRST AID PROCEDURES

If overcome by vapor, remove from exposure immediately; call a physician. If swallowed do not induce vomiting; call a physician. If breathing is irregular or stopped, start resuscitation, administer oxygen. Remove contaminated clothing and wash skin with soap and water. Flush eyes with water until irritation subsides.

## SECTION VI REACTIVITY DATA

|                                                                                                       |                |   |                     |
|-------------------------------------------------------------------------------------------------------|----------------|---|---------------------|
| STABILITY                                                                                             | UNSTABLE       | L | CONDITIONS TO AVOID |
|                                                                                                       | STABLE         | X |                     |
| INCOMPATIBILITY (Materials to avoid)<br>Strong oxidants like liquid chlorine and concentrated oxygen. |                |   |                     |
| HAZARDOUS DECOMPOSITION PRODUCTS<br>Carbon monoxide in the case of incomplete combustion.             |                |   |                     |
| HAZARDOUS<br>POLYMERIZATION                                                                           | MAY OCCUR      |   | CONDITIONS TO AVOID |
|                                                                                                       | WILL NOT OCCUR | X |                     |

## SECTION VII SPILL OR LEAK PROCEDURES

## STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all ignition sources. Keep people away. Recover free liquid. Add absorbent to spill area. Avoid breathing vapors. Ventilate enclosed spaces.

Open all windows and doors. Keep petroleum products out of streams and waterways.

## WASTE DISPOSAL METHOD

Incinerate absorbed material.

## SECTION VIII SPECIAL PROTECTION INFORMATION

## RESPIRATORY PROTECTION (Specify type)

Hydrocarbon vapor canister or supplied-air hose mask if needed.

|                                     |                                                               |                                                 |
|-------------------------------------|---------------------------------------------------------------|-------------------------------------------------|
| VENTILATION                         | LOCAL EXHAUST<br>Face velocity $> 60$ fpm                     | SPECIAL Use only with<br>adequate* ventilation. |
|                                     | MECHANICAL (General)<br>Explosion-proof ventilation equipment |                                                 |
| OTHER<br>No smoking or open lights. |                                                               |                                                 |

## PROTECTIVE GLOVES

Normally not needed.

## EYE PROTECTION

Normally not needed.

## OTHER PROTECTIVE EQUIPMENT

Hydrocarbon-insoluble apron if needed.

## SECTION IX SPECIAL PRECAUTIONS

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## PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep containers closed. Keep away from heat, sparks and open flame.

## OTHER PRECAUTIONS

Avoid prolonged or repeated contact with skin. Remove contaminated clothing.

Wash skin with soap and water after contact.

\*Adequate means equivalent to outdoors ventilation.

James W. Hammond

Director of Industrial Hygiene

Wm. G. Domask, Ph.D., P.E.

Government Regulations Advisor

# ETHYL CORPORATION

## INTER-OFFICE

To T. R. Robinson, M.D.

ADDRESS BRP

FROM J. D. Watts

ADDRESS BRT/BRP

SUBJECT MASC Toluene Operation

DATE October 8, 1975

Supplementary information on the chemical contaminants generated from the MASC toluene blending operation was obtained on September 18. Stationary and personal samples were collected in the subject area using activated charcoal and subsequent analysis by gas chromatography. The fixed station samples were collected at a sample rate of approximately 1.5 liters/min. and the personal samples were collected on 600 mg. SKC tubes at 75 cc/min.

The operation was surveyed earlier this year (February-March) and it was recommended that it be resurveyed during the summer when the potential volatility of toluene would be at its greatest. MASC toluene is a chemical compound which is utilized as a catalyst in the production of TML. It is my understanding that the blending operation is now done only once a week on the day shift. The sampling results are shown in the attached table.

### Observations & Recommendations

The inspection resurvey indicates that the hydrocarbon levels found are well within the OSHA standards on a time weighted basis. The stationary sample taken at the toluene metering station is indicative of the toluene concentration during the unloading and disconnection of the tank cars. The personal sample is indicative of the job function in and around the metering station. The personal result of 33 ppm toluene is also well within the OSHA standard of 100 ppm.

The short termed personal sample collected while the operator caught the quality control (QC) sample showed a level of 118 ppm toluene. It is recommended that the operator continue to wear respiratory protection while collecting this sample to avert this excursion.

Although personal protection, such as gloves, are worn by the employees, a neoprene or vinyl coated glove is recommended for this operation instead of cloth gloves in cases where potential skin contact with the aromatic solvent is likely (disconnecting tank car lines, quality control sample). From an environmental standpoint, there seems to be no problem with the contaminants present during the blend operation.

*J. D. Watts*  
J. D. Watts

Industrial Hygienist

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JDW:sp

cc: H. M. Taylor

MASC Toluene Sampling Results

Date: 9-18-75

Weather: Clear-PC, 76°, variable wind

| Chemical Component | Blender Shack <sup>1</sup> | Tank Car Spot Metering Station <sup>2</sup> | Personal <sup>3</sup> | QC Sample <sup>4</sup> |
|--------------------|----------------------------|---------------------------------------------|-----------------------|------------------------|
| Benzene            | 0.08                       | 0.15                                        |                       | 5.81                   |
| Butane             | 0.04                       | 0.04                                        | 0.04                  | 0.31                   |
| Carbon tet         | 0.02                       |                                             |                       |                        |
| Chloroform         | 0.40                       | 0.30                                        |                       |                        |
| EDC                | 0.13                       | 0.25                                        | 0.25                  |                        |
| Ethyl Cl           | 0.09                       | 0.13                                        | 0.14                  | 0.01                   |
| Methyl Cl          | 0.07                       | 0.09                                        | 0.10                  |                        |
| Methylene Cl       | 0.01                       | 0.04                                        |                       |                        |
| Propane            |                            |                                             | 0.22                  | 1.03                   |
| Toluene            | 0.68                       | 25.3                                        | 32.65                 | 118.0                  |
| 1,1,1 Tri          | 0.09                       | 0.16                                        |                       |                        |
| Tri                | 0.01                       | 0.05                                        | 0.08                  |                        |
| VCM                | 0.10                       | 0.07                                        | 0.09                  | 0.73                   |
| Vinylidene Cl      |                            | 0.01                                        |                       |                        |
| Unknown            | x                          | x                                           | x                     | x                      |

<sup>1</sup> Blender shack (2nd floor) approximately 75 yards north of toluene metering station

<sup>2</sup> Toluene metering station area

<sup>3</sup> Personal sample of exposure in metering area and disconnection of tank car lines

<sup>4</sup> Personal sample represents potential exposure while obtaining a QC blend sample

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