HAZARDOUS MATERIALS INFORMATION SYSTEM

CONOCO INC.

MAY 1984

TABLE OF CONTENTS

CONOCO CORPORATE HAZARDOUS MATERIALS INFORMATION SYSTEM

		PAGE NO.
I.	INTRODUCTION	3
II.	SCOPE AND APPLICATION	5
III.	HAZARDOUS MATERIALS INFORMATION SYSTEM PROCEDURES GUIDE	6
	A. FACILITY INVENTORY	6
	B. MATERIAL SAFETY DATA SHEETS (MSDSs)	6
	1. CONTENT	6
	2. CENTRAL FILE	6
	C. DEVELOPMENT/REVIEW PROCEDURES (MSDSs)	6
	1. CONOCO PRODUCTS	6
	2. PURCHASED MATERIALS	7
	D. PURCHASE APPROVAL SYSTEM	7
	E. TRAINING AND INFORMATION PROGRAM	7
	1. EMPLOYEES	7
	2. CUSTOMERS	8
	3. CONTRACTORS	8
	4. OTHER SPECIAL COMMUNICATIONS	8
	F. LABELS AND OTHER FORMS OF WARNING	8
	1. MANUFACTURER	8
	2. EMPLOYER	9
	3. PERMISSIBLE METHODS OF IDENTIFICATION	9
	4. PORTABLE CONTAINERS	9
	5. EXISTING LABELS	9
	6. LEGIBILITY	9

TABLE OF CONTENTS (CONTINUED)

	PAGE NO.
G. TRADE SECRET INFORMATION	9
1. EMERGENCY SITUATION	9
2. NONEMERGENCY SITUATION	10
3. PROCESS OR PERCENTAGE OF MIXTURE INFORMATION	10
H. APPENDICES	11
1. A—DEFINITIONS	11
2. B—MATERIAL SAFETY DATA SHEETS—REQUIRED CONTENT	12
3. C—CORPORATE REVIEW PROCEDURE FOR DEVELOPMENT OF MSDSs FOR CONOCO PRODUCTS	13
4. D—REVIEW PROCEDURE FOR MSDSs ON PURCHASED MATERIALS	14
5. E—HAZARD DETERMINATION PROCEDURE	15
6. F—CONOCO/CONTRACTOR NOTIFICATION GUIDELINE (TO BE DEVELOPED BY LEGAL DEPARTMENT)	
7. G—LIST OF HAZARDOUS CHEMICALS IN WORKPLACE (TO BE DEVELOPED BY OPERATING DEPARTMENT/SITE)	
8. H—HAZARD PROCEDURE FOR NONROUTINE TASKS (TO BE DEVELOPED BY OPERATING DEPARTMENT/SITE)	

I. INTRODUCTION

Increasing concern and attention are being focused upon the potential adverse health impact which may occur due to personnel exposure to chemical substances in the workplace, marketplace, or elsewhere in the environment.

There is a need for a Conoco occupational health program to recognize, evaluate, and control any potential hazards which are associated with both products manufactured by Conoco as well as those materials manufactured by others which are used by Conoco. Appropriate information concerning potential hazards should be transmitted to affected employees and customers. A Hazardous Materials Information System (HMIS) has been developed for Conoco Inc. The basic document in this system is a procedures guide which can be used by all departments within Conoco.

THIS HMIS SYSTEM ADDRESSES THE SCOPE AND APPLICATION OF THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) HAZARD COMMUNICATION REGULATION 29 CFR 1910.1200 (48 Fed. Reg. 53280-348, 11-25-83). THIS REGULATION IS MANDATORY FOR STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODES 20-39, WHICH FOR CONOCO INCLUDES REFINING, CONTINENTAL CARBON CO., CONOCO SPECIALTY PRODUCTS INC., AND, to a limited extent, DISTRIBUTORS OF CONOCO PRODUCTS. (See Table I on page 4 for a matrix showing mandatory provisions for those affected operating departments and the effective dates of the provisions.) Those provisions within HMIS which are mandated for SIC Codes 20-39 are so noted. This document may serve as the written Hazard Communication Program mandatedby the Hazard Communication Regulation. If used to fulfill this obligation, the document must be made available upon request to employees, their designated representatives, and OSHA. To be in full compliance with the regulation, those affected operating departments must address certain issues to ensure site-specific data is included in the document.

ALL PROVISIONS OF THIS DOCUMENT SHALL SERVE AS A PROCEDURES GUIDE (NONMANDATORY) FOR OPERATING DEPARTMENTS OF CONOCO NOT COVERED BY THE HAZARD COMMUNICATION REGULATION. Operating departments in Conoco not covered by the regulation are encouraged to participate in the Hazardous Materials Information System. Possible benefits of participation could be reduction of future liability from workers and customers, compliance with state and local Right-To-Know laws, and data to present to local, state, and federal bodies. Operating management must make the final decision to participate or not in this HMIS. Industrial Hygiene and Toxicology personnel are available upon request to consult with operating management on this issue.

HAZARD COMMUNICATION REGULATION

MANDATORY REQUIREMENT MATRIX

Provisions of Regulation	Effective Date	CONOCO DEPARTMENTS SUBJECT TO PROVISIONS OF REGULATION: Refining	Conoco Specialty Products Inc.	Conti-nental Carbon Co.	Other Op. Depts.	Distributors of Conoco Products
Develop MSDSs on Conoco Products	11-25-85	X	X	X		
Distribute MSDS for Conoco Products	11-25-85	X	X	X		X*
Insure Required Labeling of Conoco Products	11-25-85	X	X	X		X
Develop Written Hazard Communication Program**	05-25-86	X	X	X		
Develop Written Hazard Determination Procedure***	05-25-86	X	X	X		
Complete Site Inventory of Conoco Products and Purchased Material/ Designate Hazardous Inventory	05-25-86	X	X	X		
Obtain and Maintain MSDSs for All Hazardous Chemicals Used	05-25-86	X	X	X		
Maintain Labels on Incoming Chemicals	05-25-86	X	X	X		
Develop Nonroutine Task Hazard Procedure	05-25-86	X	X	X		
Develop Contractor-Employee Information	05-25-86	X	X	X		
Complete Employee Training and Information	05-25-86	X	X	X		

*Distributors of Conoco products are required to transmit required information to manufacturing purchasers in SIC Codes 20 through 39 and to other businesses supplying hazardous chemicals to other distributors.
**This document will serve as the required document.
***See Attachment E.

II. SCOPE AND APPLICATION

Operating Department Management's responsibilities include the safe production, use, marketing, and disposal of purchased material and products manufactured. These responsibilities also include determining where potential hazards exist, specifying when chemical exposure control programs are warranted, and for developing and implementing such programs. Conoco's HMIS program is intended to assist in these efforts.

This HMIS is based on the development of an inventory of products manufactured by Conoco and materials purchased for use at Conoco facilities so that an evaluation of the potential hazards can be performed. HMIS is based on the consideration and accumulation of MSDSs on all chemicals purchased and produced. The scope of the Hazard Communication Regulation includes an evaluation of all chemicals in the workplace; but the remainder of the regulation applies only to those chemicals determined hazardous by criteria set out in the regulation (see the "Hazard Determination Procedure," Appendix E). The Material Safety Data Sheet (MSDS) on each product is essential in this evaluation. From this evaluation, controls may be used in areas having potential hazards. Hazard information will be provided to employees so they, by receiving information about hazards in the workplace, can utilize protective measures.

The Medical Division will develop review procedures and assist in periodic reviews to determine compliance with regulatory requirements. With operating departments' input, the Medical Division will also be responsible for maintaining and updating the corporate materials inventory and the central repository of Material Safety Data Sheets.

Conoco Product MSDSs

Distribution of MSDSs on Conoco products to customers and corporate personnel is the responsibility of the Coordinator, Hazard Communication Program, Medical Division, Ponca City, Oklahoma.

The Hazard Communication Regulation states that MSDSs must be developed on hazardous chemicals which are manufactured under SIC Codes 20-39. The regulation requires that companies within SIC Codes 20-39 develop a "Hazard Determination Procedure" which outlines criteria which OSHA has specified to determine those chemicals that are hazardous. MSDSs on hazardous chemicals must be provided to distributors and purchasers with the initial shipment and with the first shipment after an MSDS is updated. These MSDSs may be shipped with the container or distributed at the approximate time of shipment. Distributors shall ensure that MSDSs are provided to other distributors and manufacturing purchasers of hazardous chemicals. The Medical Division will maintain records of the distribution of MSDSs.

Laboratories

The Hazard Communication Regulation applies to laboratories within SIC Codes 20-39 only as follows:

Laboratories must

1. Ensure that labels on incoming containers of hazardous chemicals are not removed or defaced.

2. Maintain any MSDSs received with incoming shipments of hazardous chemicals and ensure they are readily accessible to laboratory employees.

3. Ensure that laboratory employees are notified about hazards of chemicals in their workplace according to "Employee Information and Training" (Section E, page 7).

III. HAZARDOUS MATERIALS INFORMATION SYSTEM PROCEDURES GUIDE

This System (HMIS) serves as a procedures guide to managers of company facilities and/or operating departments in implementing the following program elements as appropriate. These elements are written as a procedures guide for all operating departments in Conoco Inc. It is noted within each section when a requirement is mandated by the OSHA Hazard Communication Regulation (for SIC Codes 20-39). (See Table on page 4.) The Hazard Communication Regulation will be referred to throughout this document as "the regulation."

A. Facility Inventory

Conduct a facility inventory of all products manufactured and of all materials used (e.g., raw materials, intermediates, water treatment agents, additives, maintenance chemicals, industrial cleaning agents, consumer and industrial paints, inks, greases, etc.).

The facility inventories should include the chemical name and/or common name as it is referenced on the MSDS. The common name may include the Chemical Abstract Services Number (CAS). It is requested by the Medical Division that site data[1] and use information be included. A format will be provided by the Medical Division. From facility inventories, the Medical Division will prepare a corporate inventory. Procedures will be established to keep the inventory current.

The regulation requires that a list of hazardous chemicals (as determined by the "Hazard Determination Procedure," Appendix E) present in the work area or workplace be included in a written Hazard Communication Program. The identity used on the list must reference an appropriate MSDS. (Appendix G will be developed by the Operating Department/site).

B. Material Safety Data Sheets

Compile a data base of Material Safety Data Sheets for products manufactured and materials used. MSDSs for all hazardous materials should be readily accessible to employees. A complete set of MSDSs for materials at a location may be maintained by the facility safety director or other facility or departmental personnel. Medical Division will maintain copies of all MSDSs in a central file to ensure a readily available reference.

The regulation requires MSDSs be developed for each hazardous chemical produced or imported. The regulation also requires MSDSs for all hazardous chemicals in the workplace be maintained and be readily accessible to employees during each work shift when they are in their work area. (See definitions for workplace and work area, Appendix A.) Operating procedures which include all required information may be used instead of MSDSs to cover groups of hazardous chemicals where it is more appropriate to address hazards of a process rather than individual hazardous chemicals.

C. Development/Review Procedures

1. *Subject all Conoco Product MSDSs to the Corporate Review Procedure.* See Appendix B for "MSDSs Required Content." See Appendix C for "Corporate Review Procedure for Development of MSDSs for ConocoProducts."

   The use of a Hazard Determination Procedure is mandatory in the review of MSDSs (see Appendix E). The regulation states that any new significant information regarding the hazards of a chemical, or ways to protect against the hazards, shall be added to the MSDS within three months.

[1]Site data includes *Area/section* of use (if breakdown *of location* is available), and *Process* which includes specific work location (unit).

2. *Subject all MSDSs for purchased materials to a review procedure*. See Appendix D for "Review Procedure for MSDSs on Purchased Materials."

D. Purchase Approval System

Establish a Chemical Purchase Approval System for controlling the introduction and new use of chemicals purchased for use at the site and for updating the chemicals inventory. It may be beneficial for plants and laboratories to establish a procedure requiring approval prior to purchase of any chemical not presently used on site or any chemical which is to be used in a manner that is new to the site. A copy of the MSDS on a particular chemical would be helpful to have prior to approving the purchase. When appropriate, the site administrator may consult with the safety and health professionals and others to help with this decision. The corporate or facility purchaser should be instructed not to process any purchase order until the order has received proper approval(s).

When a new material is purchased, it is recommended by the Medical Division that the procedure include an automatic addition to the facility inventory and a notification to the Medical Division so the corporate inventory may be kept current.

E. Training and Information Program

Develop and implement a training and information program concerning potential hazards, control programs, procedures, and protective equipment to be used with Conoco products and purchased materials.

1. *Employees*

   Employees will benefit from information and training on hazardous chemicals in their work area and on any operations where hazardous chemicals are present. It is appropriate for additional training to be given when a new hazard is introduced into the employees' work area.

   The regulation requires information and training be provided to employees on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new hazard is introduced into their work area. Employees shall be informed of:

   a. The Hazard Communication Regulation.

   b. Operations in their work area where hazardous chemicals are present.

   c. The location and availability of the written Hazard Communication Program, required lists of hazardous chemicals, and MSDSs.

   The regulation states that employee training must also include:

   a. Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.).

   b. Physical and health hazards of the chemicals in the work area.

   c. Measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used.

d. Details of the hazard communication program which includes an explanation of the labeling system, the MSDS, and how employees can obtain and use the appropriate hazard information.

The regulation requires the written Hazard Communication Program to include methods used to inform employees of the hazards of nonroutine tasks (for example, the cleaning of reactor vessels), and the hazards associated with chemicals contained in unlabeled pipes in work areas. (See Appendix H, "Hazard Procedure for Nonroutine Tasks," which is to be developed by Operating Department/Site.) Each affected operating department/site will develop and implement appropriate training.

2. *Customers*

Material Safety Data Sheets will provide customers with appropriate information to help them use and dispense our products safely.

The regulation requires chemical manufacturers must provide purchasers and distributors of Conoco products an appropriate MSDS on hazardous chemicals with the initial shipment, and with the first shipment after an MSDS is updated. These MSDSs may be shipped with the container, or sent prior to, or at the time of shipment.

Distributors of Conoco products shall provide MSDSs to other distributors and manufacturing purchasers of hazardous chemicals in SIC Codes 20-39.

3. *Contractors*

Contractors would benefit from information on hazardous chemicals their employees may be exposed to while performing their work and from any suggestions for appropriate protective measures.

The regulation requires the written Hazard Communication Program must include methods used to inform any contractor of the hazardous chemicals their employees may be exposed to while performing their work. Information should also include any suggestions for appropriate protective measures. (Appendix F will be developed by the Legal Department on "Conoco/Contractor Notification Guidelines.")

4. *Other Special Communications*

When new health or hazard information about a chemical is acquired from outside sources or as a result of testing, the department receiving the information is requested to inform the Medical Division. Medical Division will determine if the MSDS needs to be revised and if other departments need to be notified.

F. Labels and Other Forms of Warning

1. *Manufacturer*

All containers of hazardous chemicals leaving the workplace should be marked with the identity of the hazardous chemical(s) and with appropriate hazard warnings. The regulation requires all containers of hazardous chemicals leaving the workplace to be labeled, tagged, or marked with the following information:

a. Identity of the hazardous chemical(s).
b. Appropriate hazard warnings.
c. Name and address of the chemical manufacturer, importer, or other responsible party.
d. These markings must not conflict with the Hazardous Material Transportation Act or the Department of Transportation.
e. Labels must be in accord with any OSHA substance-specific standard.

2. *Employer*

Each container of hazardous chemicals in the workplace should be properly identified as to content and associated hazards. The regulation requires each container of hazardous chemicals used in the workplace be labeled with:

a. Identity of the hazardous chemical.
b. Appropriate hazard warning.

3. *Permissible Methods of Identification*

The regulation allows employers to use signs, process sheets, batch tickets, operating procedures, or other written materials in lieu of affixing labels to individual stationary process containers. The alternate method must identify the containers to which it is applicable and convey the identity of hazardous chemicals and appropriate hazard warnings. The written materials must be readily accessible to employees in their work area throughout each work shift.
Process samples for lab testing fall under labeling requirements

4. *Portable Containers*

Unlabeled portable containers with hazardous chemicals should not be left from one work shift to the next. The regulation specifies that portable containers with hazardous chemicals need not be labeled if intended for use during the same work shift by the same person performing the transfer.

5. *Existing Labels*

The regulation requires that existing labels on incoming containers of hazardous chemicals shall not be removed or defaced, unless the container is immediately relabeled. If existing labels provide required information, new labels are unnecessary.

6. *Legibility*

The regulation requires all labels or other forms of warning to be legible, in English, and prominently displayed on the container, or readily available in the work area.

7. Inappropriate labels must be removed if container re-used for other chemicals.

G. Trade Secret Information

Trade secret information is specifically addressed under the Hazard Communication Regulation. The following information pertains *only* to SIC Codes 20-39.

1. *Emergency Situation*:

When a treating physician or nurse determines that a medical emergency exists and the specific chemical identity[1] of a Conoco hazardous chemical is necessary for emergency or first-aid treatment, that information must be given. A written confidentiality agreement should be completed as soon as circumstances permit.

[1]See Definitions, Appendix A, page 11, No. 8.

2. *Nonemergency Situation*:

A specific chemical identity must be given to a health professional (physician, industrial hygienist, toxicologist, or epidemiologist) who is providing medical or other occupational health services to exposed employee(s) if:

a. The request is in writing.

b. The request describes with reasonable detail one or more of the following occupational health needs for the information:

(1) To assess the hazards of the chemicals to which employees will be exposed.
(2) To conduct or assess sampling of the workplace atmosphere to determine employee exposure levels.
(3) To conduct preassignment or periodic medical surveillance of exposed employees.
(4) To provide medical treatment to exposed employees.
(5) To select or assess appropriate personal protective equipment for exposed employees.
(6) To design or assess engineering controls or other protective measures for exposed employees.
(7) To conduct studies to determine the health effects of exposure.

c. The request explains in detail why the disclosure of the specific chemical identity is essential and that, in lieu thereof, the disclosure of the following information would not be sufficient:

(1) The properties and effects of the chemical.
(2) Measures for controlling workers' exposure to the chemical.
(3) Methods of monitoring and analyzing worker exposure to the chemical.
(4) Methods of diagnosing and treating harmful exposures to the chemical.

d. The request includes a description of the procedures to be used to maintain the confidentiality of the disclosed information.

e. The health professional, and the employer or contractor of the health professional's services (i.e.; downstream employer, labor organization, or individual employer), agree in a written confidentiality agreement that the health professional will not use the trade secret information for any purpose other than the health need(s) asserted and agree not to release the information under any circumstances other than to OSHA, as provided by regulation, except as authorized by the terms of the agreement or by Conoco.

3. *Process or Percentage of Mixture Information*:

This section does not require the disclosure under any circumstances of process or percentage of mixture information which is trade secret. (See the definition of "Specific Chemical Identity" in Appendix A, page 11, for information that must be released.)

APPENDIX A

Definitions

Taken from OSHA Hazard Communication Regulation
[1910.1200 (c) - 48 *Fed. Reg.* 53340-2, 11/25/83]

1. *Carcinogen*:
   See "Hazard Determination Procedure," Appendix E.

2. *Chemical Manufacturer*:
   An employer in SIC Codes 20 through 39 with a workplace where chemicals are produced for use or distribution.

3. *Distributor*:
   A business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to manufacturing purchasers.

4. *Employee*:
   A worker employed by an employer in a workplace in SIC Codes 20 through 39 who may be exposed to hazardous chemicals under normal operating conditions or foreseeable emergencies, including, but not limited to, production workers, line supervisors, and repair or maintenance personnel. Office workers, grounds maintenance personnel, security personnel or nonresident management are generally not included, unless their job performance routinely involves potential exposure to hazardous chemicals.

5. *Hazardous Chemical*:
   Any chemical which is a physical hazard or a health hazard.
   (See "Hazard Determination Procedure," Appendix E.)

6. *Health Hazard*:
   A chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Appendix A[1] provides further definitions and explanations of the scope of health hazards covered by this section, and Appendix B[1] describes the criteria to be used to determine whether or not a chemical is to be considered hazardous.

7. *Physical Hazard*:
   A chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

8. *Specific Chemical Identity*:
   The chemical name, Chemical Abstracts Service (CAS) registry number, or any other information that reveals precise chemical designation of the substance.

9. *Work Area*:
   A room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

10. *Workplace*:
    An establishment at one geographical location containing one or more work areas.

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[1]Contained in 48 Fed. Reg. 53280-348, 11/25/83.

APPENDIX B

Material Safety Data Sheets
Required Content

Taken from OSHA Hazard Communication Regulation
[1910.1200 (g) - 48 Fed. Reg. 53343-4, 11/25/83]

1. MSDS must be in English.
2. MSDS must contain the following information:
   - The identity used on the label (except as provided in provisions for trade secrets).
   - Single-substance include its chemical and common name(s).
   - Mixture, if tested as a whole, include the chemical and common name(s) of the *ingredients which contribute to these known hazards*, and the common name(s) of the mixture itself; or
   - Mixture (not tested on a whole)—(1) include chemical and common name of all ingredients which have been determined to be *health hazards*, and which comprise one percent or greater of the composition, except that chemicals identified as carcinogens under standard shall be listed if the concentrations are one-tenth percent or greater; and, (2) the chemical and common name(s) of all ingredients which have been determined to present a *physical hazard* when present in the mixture.
   - Physical and chemical characteristics of the hazardous chemical (such as vapor pressure, flash point).
   - The *physical hazards* of the hazardous chemical, including the potential for fire, explosion, and reactivity.
   - The *health hazards* of the hazardous chemical, including signs and symptoms of exposure, and any medical conditions which are generally recognized as being aggravated by exposure to the chemical.
   - The primary route(s) of entry.
   - The OSHA permissible exposure limit, ACGIH Threshold Limit Value, and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the material safety data sheet, where available.
   - Whether the hazardous chemical is listed in the National Toxicology (NTP) Program *Annual Report on Carcinogens* (latest edition) or identified as a potential carcinogen by the International Agency for Research on Cancer (IARC) Monographs (latest edition), or OSHA.
   - Any generally applicable precautions for safe handling and use, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for cleanup of spills and leaks.
   - Any generally applicable control measures, e.g., appropriate engineering controls, work practices, or personal protective equipment.
   - Emergency and first aid procedures.
   - Date of preparation of the MSDS or last change to it; and
   - Name, address, and telephone number of the chemical manufacturer, importer, employer, or other responsible party preparing or distributing MSDS, who can provide information.

APPENDIX C

"Corporate Review Procedure for Development of MSDSs for Conoco Products"*

1. The department producing the material will compile appropriate data on the MSDS Development Worksheet for new products or reformulated products. This worksheet will be transmitted to the Medical Division for assimilation and circulation to the review committee for completion. For scheduled reviews, the existing MSDS will be circulated to the review committee.

2. The Medical Division will:

   a. Distribute the worksheet or the applicable MSDS to the following:

      (1) Departmental Technical Review—to review ingredients, physical data, reactivity data, and other technical information.

      (2) Legal—to review language from potential liability standpoint.

      (3) Medical Division—to review toxicology, industrial hygiene, and medical information.

      (4) Transportation—to review hazardous classification, transportation, and storage information.

      (5) Environmental Conservation—to review spill or leak procedures and disposal information.

      (6) Corporate Safety—to review physical hazards including fire and explosion data, safety equipment, and protective clothing.

   b. Develop draft MSDS based on the above input and circulate to the above groups for additional comment and certification of review.

   c. Develop final MSDS and circulate to the operating department producing the material for final approval and sign-off.

   d. Provide MSDSs internally and to customers.

3. Each MSDS must be revised within three months whenever relevant, new information is received.

4. Each MSDS must be reviewed at least every two years by review committee specified in 2.a. above. The Medical Division will coordinate the schedule updates of MSDSs.

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*The Hazard Determination Procedure (Appendix E of the Hazardous Materials Information System), which is required under the Hazard Communication Regulation 48 Fed. Reg. 53280-53348, 11/25/83, will be used in this review process.

APPENDIX D

Review Procedure for Material Safety Data Sheets on Purchased Materials

1. *Tier I*:
   Each facility will specify appropriate personnel who shall implement a review procedure appropriate for that facility on all incoming Material Safety Data Sheets. (See Hazard Determination Procedure, Appendix E.)

   a. MSDSs will be acquired on all purchased materials, and those MSDSs on hazardous materials shall be made readily available to employees while in their work area.

   b. If MSDSs are not received prior to or with purchased products, efforts will be made to acquire one as soon as possible.
      (1) The operating department shall contact the manufacturer.
      (2) If the operating department cannot obtain an MSDS, the Medical Division will be asked for assistance.

   c. If an MSDS has inadequate information, a request will be made by the operating department to the manufacturer for clarification or for additional information.

   d. If additional information is not available from the manufacturer, or a question arises concerning the accuracy or adequacy of information, the operating department shall refer the MSDS to the Medical Division for follow-up.

   e. Copies of all MSDSs will be provided to the Medical Division to establish a corporate repository.

2. *Tier II*:

   a. When an MSDS is referred to the Medical Division, the Conoco Senior Toxicologist shall contact the manufacturer for either an MSDS or for additional information.

   b. If necessary information is not available from the manufacturer, the Medical Division shall do a literature search for additional information.

   c. Internal information may be developed and cross-referenced with the manufacturer's MSDS.

   d. The Medical Division may ask the members specified in Appendix C as defined in item 2(a), "Corporate Review Procedure for Development of MSDSs for Conoco Products," for assistance in a Tier II review of any MSDS.

3. From time to time, regulatory action, public concern, new epidemiological data, or new toxicity information may precipitate the need for immediate review and subsequent action on a particular chemical MSDS. The Medical Division shall notify those operating departments of any action or review. Operating departments will have the opportunity to comment on actions recommended.

APPENDIX E

Hazard Determination Procedure

Manufacturers, employers, and importers are to evaluate materials produced and used in their workplaces to determine if they are hazardous. The hazard determination procedure is required by the OSHA Hazard Communication Regulation (48 Fed. Reg. 53280-53348, November 25, 1983). Quality of a hazard communication program is largely dependent upon the adequacy and accuracy of the hazard determination process. The hazard determination requirement of this standard is performance-oriented and is a process which relies heavily on the professional judgment of the evaluator. The written procedure for this evaluation is to be available, upon request, to employees, their representatives, and the Assistant Secretary and Director of OSHA. The hazard determination will be conducted so that the results can be used for (a) product labeling, (b) Material Safety Data Sheets (MSDSs), and (c) employee training. This review allows manufacturers and customers to better control physical and health hazards.

It may prove useful to document the reasoning and conclusions as to how the material was determined to be hazardous. If the material is determined to be hazardous, requirements of the Hazard Communication Regulation must be met. The hazard determination procedure for purchased materials or Conoco products should be conducted as follows.

- Purchased Materials—The MSDS will be reviewed by appropriate on-site personnel to determine whether the material possesses *physical*- and/or *health*-effect properties that make it a hazardous material. Refer to Appendix D for the "Review Procedure for MSDSs on Purchased Materials," as this procedure explains how the adequacy of the MSDS can be determined. Further assistance can be obtained by contacting the Medical Division.

- Conoco Products and Intermediate Materials—All MSDSs will be developed and reviewed by the corporate review procedure (Appendix C) which utilizes this Hazard Determination Procedure. Appropriate plant-site personnel will determine from the MSDS whether the material possesses physical—or health—effect properties that make it a hazardous material.

Hazardous Materials:

A hazardous chemical is defined as any chemical which is a *health* or *physical* hazard. These two categories of hazards are defined below.

A. *Health-Effect Properties*: A list of available data sources pertaining to health hazards can be found by referring to Hazard Communication Regulation Fed. Reg. 53347. Test data for mixtures will be evaluated as follows:

   - Test data for the mixture, itself, is applicable in making a hazard determination.

   - If the mixture has not been tested, then the mixture is considered to have the same health hazards as components present at a concentration of 1 percent or more, except the cutoff point is 0.1 percent for components considered to be carcinogenic. These cutoff concentrations should be disregarded if either a health or carcinogenic hazard exists below 1 percent or 0.1 percent, respectively.

   - Any adverse health effect must be reported for which there is statistically significant evidence based on at least one positive study conducted according to established scientific principles. Qualifying statements and negative results may also be included. However, the hazard determination procedure must utilize the following definitions:

1. *Hazardous Chemicals*:
   a. Substances regulated by OSHA under 29 CFR Part 1910. Subpart Z (Toxic and Hazardous Substances).

   b. Substances listed by the American Conference of Governmental Industrial Hygienists (Threshold Limit Values, TLV).

2. *Carcinogen*:
   A chemical or material that is categorized as being a confirmed or suspected carcinogen by the following sources (use latest editions):
   —International Agency for Research on Cancer (IARC) Monographs
   —National Toxicology Program (NTP) Annual Report on Carcinogens
   —OSHA, 29 CFR Part 1910, Subpart Z.

   Lists for items 1 and 2 above are available from the Medical Division.

3. *Irritant*:
   A material which causes reversible inflammatory effects on living tissue. Thus, the exposed skin heals following exposure. Testing in rabbits is used to determine skin irritation (an example is the 4-hour exposure study 16 CFR 1500.41) or eye irritation (study described in 16 CFR 1500.42).

4. *Corrosive*:
   A material that causes visible destruction or irreversible damage on living tissue. That is, the exposed skin does not completely heal following exposure. An example is a method for evaluating skin irritation described by the U.S. Department of Transportation (49 CFR Part 173; 4-hour exposure).

5. *Sensitizer*:
   A material that causes a substantial proportion of animals or humans to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

6. *Target Organ Effects*:
   The workplace can have a large range of potential hazards that the employermust consider. Examples of chemical toxicities include effects on the liver, nerves, kidney, blood/ hematopoietic and reproductive systems, lung, skin and eye. Target organ effects may be used to indicate whether a material is hazardous.

7. *Toxic and Highly Toxic Effects*:

Category of Toxicity	Route of Exposure[a]		
	Oral (rats)	Skin (rabbits)[b]	Inhalation (rats)[c]
Highly Toxic:	< 50 mg/kg	< 200 mg/kg	Gas/vapor, < 200 ppm Mist/dust, < 2 mg/L
Toxic:	> 50 < 500 mg/kg	> 200 < 1,000 mg/kg	Gas/vapor, > 200 < 2,000 ppm Mist/dust, > 2 < 20 mg/L

[a]The LD_{50} values are expressed as milligrams per kilogram of body weight (mg/kg), parts per million (ppm), or milligrams per liter (mg/L).
[b]The skin exposure is for 24 hours.
[c]The inhalation exposure is for one (1) hour.

B. *Physical-Effect Properties*: These properties will be assessed by determining whether there is scientifically valid evidence that the material is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water reactive, as defined below.

If a mixture has not been tested as a whole to determine whether the mixture is a physical hazard, the chemical manufacturer, importer, or employer may use whatever scientifically valid data is available to evaluate the physical hazard potential of the mixture.

1. *Combustible Liquid*:
Any liquid having a flash point at or above 100°F (37.8°C), but below 200°F (93.3°C), except any mixture having components with flash points of 200°F (93.3°C), or higher, the total volume of which makes up 99 percent or more of the total volume of the mixture.

2. *Compressed Gas*:
(i) A gas or mixture of gases having in a container an absolute pressure exceeding 40 psi at 70°F (21.1°C).

(ii) A gas or mixture of gases having in a container an absolute pressure exceeding 104 psi at 130°F (54.4°C) regardless of the pressure at 70°F (21.1°C).

(iii) A liquid having a vapor pressure exceeding 40 psi at 100°F (37.8°C) as determined by ASTM D-323-72.

3. *Explosive*:
A chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

4. *Flammable*:
A chemical that falls into one of the following categories:

(i) "Aerosol, flammable" means an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening, or a flashback [a flame extending back to the valve] at any degree of valve opening.

(ii) "Gas, flammable" means:

(a) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of thirteen (13) percent by volume or less.

(b) A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than twelve (12) percent by volume, regardless of the lower limit.

(iii) "Liquid, flammable" means any liquid having a flash point below 100°F (37.8°C), except any mixture having components with flash points of 100°F (37.8°C) or higher, the total of which makes up 99 percent or more of the total volume of the mixture.

(iv) "Solid, flammable" means a solid, other than a blasting agent or explosive as defined in 29 CFR 1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

5. *Organic Peroxide*:
An organic compound that contains the bivalent O-O-structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

6. *Oxidizer*:
A chemical other than a blasting agent or explosive as defined in 29 CFR 1910.109(a) that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

7. *Pyrophoric*:
A chemical that will ignite spontaneously in air at a temperature of 130°F (54.4°C) or below.

8. *Unstable (Reactive)*:
A chemical which in the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks pressure or temperature.

9. *Water-Reactive*:
A chemical that reacts with water to release a gas that is either flammable or presents a health hazard.