



Lead Industries Association, Inc.

292 Madison Avenue • New York, N. Y. 10017 • Telephone: (212) 532-2373

Environmental Health Department

December 13, 1971

To: All Members of the Lead Industries Association, Inc.

Subject: Guidelines for Completing the Material Safety Data Sheet

Gentlemen:

Guidelines for completing the Department of Labor Material Safety Data Sheet (MSDS), form LSB-005-4, are enclosed. The use of the MSDS, which was originated under the Longshoring and Maritime Safety Act, has increased tremendously, and continued increases of use will occur under the Occupational Safety and Health Act of 1970. We have had numerous requests for assistance in completing the MSDS, and as a result, have written guidelines which are general, but provide specific information relating to lead in Sections II--Hazardous Ingredients, and V--Health Hazards. The statement referring to the "Effects of Over-exposure" for lead was based on responses from the members of the Environmental Health Committee of the LIA and the specific wording is recommended for all exposures involving lead.

The guidelines should provide sufficient information to comply with the various requirements for health and safety information on the hazardous properties of products.

Sincerely,

Donald R. Lynam
Assistant Manager,
Environmental Health

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THE MATERIAL SAFETY DATA SHEET

BACKGROUND

A copy of a Material Safety Data Sheet (Form LSB-00S-4) is attached. The form was originated under the Longshoremen's and Harbor Worker's Compensation Act, but has been extended as a Military Standard (MIL-STD 1341) and is required by the Department of Defense on all contract bids. It is also to be included in all Invitations for Bid issued by GSA and all non-defense agencies. The Department of Labor, under the Occupational Safety and Health Act of 1970, will most likely in the future require this form, in either the present or modified form.

The publication, "Material Safety Data Sheet, Requirements for Reporting Hazardous Materials, Safety and Health Regulations, For Ship Repairing, Shipbuilding and Ship Breaking," is available from the Department of Labor and provides information to help in completing the MSDS. The Department of Labor allows the use of an essentially similar form as a replacement for the MSDS. An essentially similar form is interpreted as one in which Section II is modified to indicate only the product or group of products which it is intended to cover. The remaining sections of the form must list the items of information in the sequence shown on Form 00S-4 but may be expanded or decreased as long as all required headings are retained. An essentially similar form must be approved by the Department of Labor before it can be used.

The suggested guidelines for filling out the MSDS which follow include in Section V Health Hazards, the recommended wording for effects of overexposure for lead. This suggested wording was based on responses from the members of the Environmental Health Committee of the Lead Industries Association. This information should be adequate to comply with the provisions of the Occupational Safety and Health Act of 1970, and provide for information on lead exposure to those members who presently use the MSDS or are required to provide information on the hazardous properties of their products.

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The National Paint, Varnish and Lacquer Association included a very detailed discussion of the Material Safety Data Sheet and guidelines for filling out the Material Safety Data Sheet in their technical bulletin dated August 23, 1971. Much of their information in either original or revised form is included here and acknowledgement is made to NPVLA.

Guide for Filling Out the Material Safety Data SheetSection I

MANUFACTURER'S NAME AND ADDRESS: Self-explanatory. Give source of data if other than manufacturer.

EMERGENCY TELEPHONE NUMBER: To obtain further information in the event of an emergency involving the material.

CHEMICAL NAME AND SYNONYMS: Refers only to products consisting of a single element or compound.

TRADE NAME AND SYNONYMS: If any.

CHEMICAL FAMILY: Refers to generic name of single elements and compounds.

FORMULA: Refers only to the chemical formula for single elements or compounds, not to the formulations of a mixture.

Section II - HAZARDOUS INGREDIENTS

A hazardous ingredient is defined by the DOL as a hazardous material in a mixture in sufficient concentration to produce enough flammable vapor or gas to ignite or to produce acute or chronic adverse affects in doses which could result from normal use or predictable misuse of the mixture containing it. Ingredients of a hazardous nature shall be noted by chemical name in one of the three divisions of Section II, Vis, Paints, Preservatives, and Solvents; Alloys and Metallic Coatings (such as plating, cladding, and metallizing); and Hazardous Mixtures of Other Liquids, Solids, or Bases (this is the category for lead).

A Hazardous Material is defined as a material which has one or more of the following characteristics:

- 1 - Flashpoint below 140°F
- 2 - Threshold Limit Value (TLV) below 500 p.p.m. for gases and vapors, below 15 mg/M³ for fumes, and 25 MPPCF for dusts.
- 3 - A single dose oral LD₅₀ below 500 mg/Kg.
- 4 - Is subject to polymerization with the release of large amounts of energy.
- 5 - Is a strong oxidizing or reducing agent.

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6 - Causes first degree burns to skin in short time exposure, or is systemically toxic by skin contact.

7 - In the course of normal operations, may produce dusts, gases, fumes, vapors, mists or smokes which have one or more of the above characteristics.

The TLV for Lead is 0.2 mg/M^3 , but is scheduled to be on the intended change list for 1971, at a value of 0.150 mg/M^3 . Under the OSHA of 1970, the American National Standard of 0.20 mg/M^3 for lead, which is published in "Acceptable Concentrations of Lead and Its Organic Compounds," ANSI Standard Z37.11-1969, takes precedent over the TLV for lead because the ANSI Standard is a consensus standard.

The ANSI Standard is available from ANSI, 1430 Broadway, New York, New York, 10018.

TLV are obtained from: Latest list of "TLV of Airborne Contaminants and Intended Changes," American Conference of Governmental Industrial Hygienists, 1014 Broadway, Cincinnati, Ohio 45202. Price: \$0.50.

There is no heading for LD₅₀ information on the present MSDS form. If the hazardous property is based on LD₅₀ data, enter the material and its LD₅₀ figure under this heading. LD₅₀ values are found in:

1. "Toxic Substances Annual List, 1971," stock #1716-004,
Government Printing Office
Washington, D. C. 20452
Price: \$3.75
2. "Clinical Toxicology of Commercial Products"
The Williams and Wilkins Company
428 E. Preston Street
Baltimore, Maryland 21202
Price: \$24.50

Section III - PHYSICAL DATA

Boiling Point - Refers to the temperature at which the liquid boils, in degrees F., at a pressure of 760 mm Hg. For mixtures, a boiling range is acceptable.

Vapor Pressure - Refers to pressure of saturated vapor above the liquid in mm of Hg, at 20°C.

Vapor Density - Refers to the relative density or weight of a vapor or gas (with no air present) compared with an equal volume of air. Values should be given in the ambient temperature range of 60°- 90°F. to facilitate field usage.

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Solubility in Water - The following terms shall be used to describe the solubility of the product by weight in distilled water at 50°F.:

Negligibleless than 0.1 percent
 Slight.....0.1-1 percent
 Moderate.....1-10 percent
 Appreciable.....more than 10 percent
 Complete.....in all proportions

Specific Gravity - Refers to the ratio of the weight of a volume of material to the weight of an equal volume of water at 39.2°F.

Percentage Volatile by Volume - Refers to the percentage of the liquid or solid by volume that evaporates at the ambient temperature of 70°F. This applies to solids such as Naphthalene.

Evaporation Rate - Refers to whether the rate is greater or less than 1. Either Butyl Acetate or Ether may be taken as unity. Insert the name of whichever is used.

Appearance and Odor - Give a brief description, e.g., viscous, colorless liquid with aromatic odor.

It is preferred that information supplied in this system be on the entire mixture. Be sure to note the ingredient or material that the information refers to.

References which may be helpful are:

1. "Fire Protection Guide on Hazardous Materials"
 National Fire Protection Association, International (NFPA)
 60 Batterymarch Street, Boston, Mass. 02110
 Price: \$5.50
2. "Handbook of Organic Industrial Solvents" (Technical Guide #6)
 American Mutual Insurance Alliance
 20 North Wacker Drive
 Chicago, Illinois 60606
 Price: \$0.30

Section IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point - Refers to the temperature in degrees F., at which a liquid will give off enough flammable vapor to ignite. The closed cup values shall be given. When multi-component paint systems are used and mixed in the field, the flash point of the individual components shall be noted.

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Flash point data may also be found in:

"Fire Protection Guide on Hazardous Materials"
This information is under Text No. 325A, "Flash Point Index of Trade Name Liquids" for proprietary liquids, and Text No. 325M "Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids" for generic materials. No. 325A is available separately for \$2.50.

Flammable or Explosive Limits - refers to the range of gas or vapor concentrations (percent by volume in air) which will burn or explode if an ignition source is present. LEL means the lower explosive limit, and UEL means the upper explosive limit. Knowledge of the LEL will aid in determining the volume of ventilation needed for an enclosed space to prevent fires and explosions.

Listings of explosive limits for generic materials may be found in:

1. "Fire Protection Guide on Hazardous Materials"
No. 325M "Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids."
2. "Handbook of Organic Industrial Solvents"

Extinguishing Media - List the firefighting media suitable for use on the burning material. For certain specific chemicals, special formulations, in addition to the standard agents, are available for extinguishing fires. These should be indicated by generic name. The standard firefighting agents are water fog, foam, alcohol foam, CO₂, and dry chemical.

For a listing of suitable materials to use on burning liquids, specific recommendations and limitations, the following are recommended:

"Fire Protection Guide on Hazardous Materials"
No. 325M "Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids"
No. 49 "Hazardous Chemicals Data"
(No. 49 is available separately for \$2.50)

For water-thinned or non-flammable products, enter N.A.

Special Firefighting Procedures - If water is unsuitable, specify the firefighting media to be used. Also list any necessary personal protective equipment.

References for this information are:

1. "Fire Protection Guide on Hazardous Materials"
No. 325M "Fire Hazard Properties of Flammable
Liquids, Gases, and Volatile Solids"
No. 49 "Hazardous Chemicals Data"
2. "Respiratory Protective Devices Approved by the
Bureau of Mines" I.C. 8436, dated 1969.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Price: \$0.40

For water-thinned or non-flammable products, enter N.A.

Unusual Fire and Explosion Hazards - Specify such hazards and/or any special conditions that govern them. In closed containers containing liquid, mention the possibility of pressure build-up due to heat exposure. Note that water may be used to cool the container. If solvent-based or flammable, caution against application to hot surfaces, and use in areas where electric sparks may be present or where static may be generated. A specific fire hazard, not covered by other sections of the sheet, should be explained here. For information on hazards of some raw materials, see:

"Fire Protection Guide on Hazardous Materials"
No. 49 "Hazardous Chemicals Data"

Section V - HEALTH HAZARDS

In completing this section, you should refer to information on raw materials which retain hazardous properties in the system. This would include both the effects of overexposure and first aid treatment.

THRESHOLD LIMIT VALUE: Refers to data for a single element or compound only. Enter N.A., or make reference to Section II for a multi-component system or mixture. A single component, such as a compound, may be highlighted in this section by giving its TLV.

EFFECT OF OVEREXPOSURE: Appropriate information on the effects of inhalation, and skin or eye exposure should be entered here. The information should be in the form of simple symptomatic statements such as "pale and nauseous, dizzy feeling, weak, irritation, etc." Helpful information may

be found in the following publications:

"Fire Protection Guide on Hazardous Materials"
No. 49 "Hazardous Chemicals Data"

"Dangerous Properties of Industrial Materials", by Irving Sax
Reinhold Publishing Corporation
450 West 33rd Street
New York, New York 10001
Price: \$27.50

The following wording of the "Effects of Overexposure for lead is suggested:

Effect of Overexposure: Prolonged excessive absorption of inorganic lead by ingestion or inhalation of dust and fume is characterized by abdominal pain or what is sometimes referred to as "lead colic," metallic taste in mouth, loss of weight, pains in the muscles, and muscular weakness. The similarity of these symptoms with those of other illnesses require that excessive absorption of lead be verified by medical examination and analyses of biological specimens. Consult the physician if you have symptoms of illness.

Skin or eye contact: For inorganic lead compounds, absorption through the skin is of no practical importance.

EMERGENCY FIRST AID PROCEDURES: Only the areas of inhalation and eye and skin contact should be considered here. The first aid information given is only of an emergency nature. Statements should be simple and direct, such as "remove to fresh air, lay patient down, cover with blanket, flush eyes with clean water for 15 minutes, flush skin areas with large amounts of water, remove saturated clothing, etc." Include the statement, "refer to a doctor." First aid information may be found in:

1. "Clinical Toxicology of Commercial Products"
2. "Dangerous Properties of Industrial Materials"

Emergency first aid procedures: "Unimportant for Lead"

Section VI - REACTIVITY DATA

Stability - indicate, by cross or check, whether stable or unstable under reasonably foreseeable conditions of storage, use, or misuse. If

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unstable, list those conditions which may cause a dangerous reaction.

Examples: Shock from dropping; temperature above 150°F.

Incompatibility - Provide information on such common materials and contaminants with which the product may reasonably come into contact to produce a reaction which would release large amounts of energy. If none, so state.

The following reference is recommended:

"Fire Protection Guide on Hazardous Materials"
No. 491M "Manual of Hazardous Chemical Reactions"
No. 491M is available separately for \$2.50

If no materials are known, enter "NONE" or "UNKNOWN."

Hazardous Decomposition Products - List hazardous materials produced in dangerous amounts by burning, oxidation, or by heating in welding or burning. Thermal decomposition products, such as CO, CO₂, and hydrochloric acid from vinyl chloride plastics are examples. This information can be used in determining respiratory protection required under Sections IV and IX.

Hazardous Polymerization - Hazardous polymerization is that which takes place at a rate which releases large amounts of energy. Indicate, by check or cross, whether or not hazardous polymerization can occur. If so, list those reasonably foreseeable storage conditions which would start polymerization. Include the expected time period in which the inhibitors may be used up.

Section VII - SPILL OR LEAK PROCEDURES

Steps to be taken in case the material is released or spilled: Indicate any applicable precautions as: avoiding breathing gases and vapors; contact with liquids and solids; removing sources of ignition; any special equipment used for cleaning up, such as glass or plastic scoops; and disposal of spilled solids or liquids, such as flushing with water, returning material to container, burning, etc. References may be made here for protective measures outlined in Section VIII.

Waste Disposal Method: Outline the method to be used in disposing of the material. Caution against incinerating closed containers. Make note to guard against conditions that would cause spontaneous ignition. Specify that disposal be done in accordance with local, state, and federal regulations.

Section VIII - SPECIAL PROTECTIVE INFORMATION

Respiratory Protection: List the specific Bureau of Mines respiratory protective devices for open, restricted or confined areas. The following references are recommended:

1. "Respiratory Protective Devices Approved by the Bureau of Mines," I.C. 8436
2. "Dangerous Properties of Industrial Materials"
3. "Respiratory Protective Devices Manual" published by the American Industrial Hygiene Association and the American Conference of Governmental Industrial Hygienists, 1963.
Price: \$8.50

Ventilation: State that ventilation should be provided as required by the job conditions to keep TLV listed in Section II below acceptable limits and the LEL in Section IV below the stated concentration.

Special, Other: Enter N.A. unless a specific problem exists requiring a special pattern of ventilation, such as providing ventilation to remove decomposition products during welding or flame cutting of the material.

The following publications are suggested as possible sources of information:

1. "Dangerous Properties of Industrial Materials"
2. "Handbook of Organic Industrial Solvents"
3. Latest Edition of the "Ventilation Manual," published by the American Conference of Governmental Industrial Hygienists.

Protective Gloves: If the material is hazardous, either systemically or by causing skin irritation, specify that protective gloves should be worn if contact is likely. One source listing protective glove information is:

"Protective Clothing and Equipment"

U.S. Department of Army Pamphlet 385-3, August 1968

U.S. Army Publication Agency

Nassif Building, Room 524

5611 Columbia Pike

Washington, D.C. 20315 - No charge on a single copy

Eye Protection: Recommend the use and type of safety eyewear to guard against eye irritation or damage from spray and liquid splashes if this is a hazard. Information on protective eyewear is found in:

"Practice for Occupational and Educational Eye and Fire Protection" ANSI Z87.1-1968

American National Standards Institute

1430 Broadway

New York, New York 10018 - Price \$4.50

Other Protective Equipment: Recommend the use of protective outerwear such as coveralls or aprons to protect against clothing contamination and skin contact where contact may cause systemic poisoning or skin irritation.

Section IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling and storage: Indicate any special precautions to be taken, such as in handling or storing, to avoid reaction hazards. When applicable, indicate safe storage life of product in relation to reactivity. Also indicate any other general precautions to be taken.

Storage information for hazardous materials is found in:

1. "Dangerous Properties of Industrial Materials"
2. "Fire Protection Guide on Hazardous Materials"
No. 49 "Hazardous Chemicals Data"

Other Precautions: Indicate any general precautions usually given with the product such as "Do not take internally, avoid prolonged contact with skin, etc." If solvent-based, recommend grounding of containers when pouring and warn that the free fall of the liquid should not be over a few inches to avoid generation of static charges which may produce sparks. Include personal protective equipment for protection against decomposition products listed in Section VI. Information on protection against dust on particles from sanding, blasting, or abrading of the material may also be entered here.

LIA14578

Form Approved
Budget Bureau No. 44-01387
Approval Expires April 30, 1971

Form No. LSA-008-4
May 1968

U.S. DEPARTMENT OF LABOR
WORKPLACE STANDARDS ADMINISTRATION
Bureau of Labor Standards

MATERIAL SAFETY DATA SHEET

SECTION I

MANUFACTURER'S NAME		EMERGENCY TELEPHONE NO.	
ADDRESS (Number, Street, City, State, and ZIP Code)			
CHEMICAL NAME AND SYNONYMS		TRADE NAME AND SYNONYMS	
CHEMICAL FAMILY		FORMULA	

SECTION II HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FILL		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)

SECTION III PHYSICAL DATA

BOILING POINT (°F)		SPECIFIC GRAVITY (H ₂ O = 1)	
VAPOR PRESSURE (mm Hg)		PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR = 1)		EVAPORATION RATE (= 1)	
SOLUBILITY IN WATER			
APPEARANCE AND ODOR			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Let	Upt
EXTINGUISHING MEDIA			
SPECIAL FIRE FIGHTING PROCEDURES			
UNUSUAL FIRE AND EXPLOSION HAZARDS			

N 3447.02

THRESHOLD LIMIT VALUE
EFFECTS OF OVEREXPOSURE
EMERGENCY AND FIRST AID PROCEDURES

SECTION VI REACTIVITY DATA			
STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE		
INCOMPATIBILITY (Materials to avoid)			
HAZARDOUS DECOMPOSITION PRODUCTS			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR		

SECTION VII SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	
WASTE DISPOSAL METHOD	

SECTION VIII SPECIAL PROTECTION INFORMATION		
RESPIRATORY PROTECTION (Specify type)		
VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL (General)	OTHER
PROTECTIVE GLOVES		EYE PROTECTION
OTHER PROTECTIVE EQUIPMENT		

SECTION IX SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	
OTHER PRECAUTIONS	