FED-STD-313C
March 1, 1988
SUPERSEDING
FED-STD-313B
April 14, 1983

FEDERAL STANDARD

MATERIAL SAFETY DATA, TRANSPORTATION DATA AND DISPOSAL DATA FOR HAZARDOUS MATERIALS FURNISHED TO GOVERNMENT ACTIVITIES

This standard is approved by the Commissioner, Federal Supply Service, General Services Administration for the use of all Federal Agencies.

1. Scope and Purpose. This standard establishes requirements for the preparation and submission of Material Safety Data Sheets (MSDS) by contractors who provide hazardous materials to Government activities. Data obtained will be used within the Government in employee safety and health programs and to provide for safe handling, storage, use, transportation and environmentally acceptable disposal of hazardous materials by Government activities.

2. Referenced Documents. The following documents form a part of this standard to the extent specified herein. Unless otherwise indicated, the issues in effect on date of invitation for bids or request for proposal shall apply.

Federal regulations

10 CFR - Energy.

29 CFR Part 1910 - Occupational Safety and Health Standards.

39 CFR - Postal Service.

40 CFR - Protection of Environment.

49 CFR 171-179 - Hazardous Materials Regulations.

(The Code of Federal Regulations (CFR) and the Federal Register (FR) are for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. When indicated, reprints of certain regulations may be obtained from the Federal agency responsible for issuance thereof.)

US Air Force Regulation:

AFR 71-4 - Packaging and Materials Handling -- Preparation of Hazardous Materials for Military Air Shipment

FSC MISC

(Application for copies should be addressed the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

National Institute for Occupational Safety and Health:

"Registry of Toxic Effects of Chemical Substances"

(Application for copies should be addressed to: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health (NIOSH Pub. No. 80-102))

International Air Transport Association:

"Dangerous Goods Regulations"

(Application for copies should be addressed to: Cargo Network Services Corporation, 300 Garden City Plaza, Suite 400, Garden City, NY 11530.)

International Maritime Organization:

"International Maritime Dangerous Goods Code"

(Application for copies should be addressed to: International Maritime Organization, 101-104 Piccadilly, London, WIV OAE, England.)

American Conference of Governmental Industrial Hygienists (ACGIH):

"Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment"

(Application for copies should be addressed to: American Conference of Governmental Industrial Hygienists, 6500 Glenway Avenue, Building D-5, Cincinnati, OH 45211).

United Nations:

"UN-Recommendations on the Transportation of Dangerous Goods"

(Application for copies should be addressed to: Labelmaster, 5724 North Pulaski Road, Chicago, IL 60646).

3. Requirements.

3.1 Referencing this standard in purchase documents. Government agencies shall reference this standard in commodity specifications, contracts, and other purchase documents to assure inclusion of adequate requirements and clear instructions to contractors for the preparation and submission of Material Safety Data Sheets.

3.2 Preparation and submission of MSDS.

3.2.1 When an MSDS is required. Contractors shall furnish a separate MSDS for each individual item to which 3.2.1.1, 3.2.1.2, 3.2.1.3 or 3.2.1.4 apply.

3.2.1.1 An MSDS shall be furnished for every item when the contract or order specifically requires an MSDS be submitted for the item.

3.2.1.2 An MSDS shall be submitted for every item in those Federal Supply Classes (FSC's) listed in table I of Appendix A of this standard.

3.2.1.3 An MSDS shall be submitted for every hazardous item in those Federal Supply Classes listed in table II of Appendix A of this standard.

3.2.1.4 An MSDS shall be submitted for every item which is classified as hazardous in paragraph 3.3 of this standard.

3.2.2 Preparation of the MSDS. The MSDS shall contain all the information specified in 3.4 and shall be prepared on one of the forms or formats listed in 3.2.2.1 - 3.2.2.4. Alternate Form A is the preferred form to use for data submission. When Alternate Form A is not used, the submitter shall ensure that all the required information is furnished, either annotated on the form or securely attached thereto.

3.2.2.1 Alternate Form A (see figure 1).

3.2.2.2 OSHA Form 174 (see figure 2).

3.2.2.3 Any locally prepared form containing all the required information.

3.2.2.4 A computer generated printout containing all the required information.

3.2.3 Submission of the MSDS.

3.2.3.1 One copy of the MSDS shall be furnished to the Service/Agency MSDS receipt point listed in paragraph 4 for the Military service or Federal agency that purchased the item.

3.2.3.2 Other copies of the MSDS shall be provided as specified in the contract, order, and the Hazard Communication Rule (29 CFR 1910.1200).

3.2.4 Revision of MSDS. The contractor shall submit a revised MSDS when there has been a change in the composition or characteristics of the product which changes any of the information on the MSDS, or when the contractor becomes newly aware of any significant information regarding the hazards of a chemical or ways to protect against hazards. The information shall be added to the MSDS within 3 months. The revised MSDS shall be furnished with the next shipment of the product as specified in paragraph 3.2.3 above.

3.3 Definition of hazardous material. The contractor shall evaluate each item furnished to the Government and identify all hazardous items. For the purpose of this standard, a hazardous material is defined as a material having one or more of the characteristics in paragraphs 3.3.1 - 3.3.13.

3.3.1 The item is a health hazard or physical hazard as defined in 29 CFR 1910.1200(c). Health hazards include carcinogens, corrosive materials, highly toxic materials, irritants, sensitizers, toxic materials, and materials which damage the skin , eyes or internal organs. Physical hazards include combustible liquids, compressed gasses, explosives, flammable materials, organic peroxides, oxidizers, pyrophoric materials, unstable(reactive) materials and water-reactive materials.

3.3.2 The item and/or its disposal is regulated by the Environmental Protection Agency under 40 CFR.

3.3.3 The item is hazardous in accordance with the Department of Transportation Hazardous Materials Regulations (49 CFR 171-179).

3.3.4 The item is hazardous in accordance with the International Maritime Dangerous Goods Code of the International Maritime Organization (IMO).

3.3.5 The item is hazardous in accordance with the Dangerous Goods Regulations of the International Air Transport Association (IATA).

3.3.6 The item is radioactive and regulated under 10 CFR.

3.3.7 The item is classified as hazardous in AFR 71-4.

3.3.8 The item contains asbestos, mercury or polychlorinated biphenyls.

3.3.8 The item is magnetic and regulated under 49 CFR.

3.3.10 The item has a flashpoint below 200 degrees F (93 degrees C) closed cup, or is subject to spontaneous heating or is subject to polymerization with release of large amounts of energy when handled, stored, and shipped without adequate control.

3.3.11 The item is a flammable solid as defined in 49 CFR 173.150, or is an oxidizer as defined in 49 CFR 173.151, or is a strong oxidizing or reducing agent with a standard reduction potential of greater than 1.0 volt or less than - 1.0 volt.

3.3.12 The item in the course of normal operations, accidents, leaks or spills may produce dusts, gases, fumes, vapors, mists, or smokes with one or more of the above characteristics.

3.3.13 The item has special characteristics which in the opinion of the manufacturer or the Government could cause harm to personnel if used or stored improperly.

3.4 Information required on the MSDS. The MSDS shall contain the following information. The information shall be entered as specified in Appendix B. The preparer of the MSDS shall provide a response for each item listed below. If there is no information on a given item the preparer shall enter "NOT APPLICABLE" or "NO INFORMATION FOUND".

3.4.1 The contract number.

3.4.2 The National Stock Number, activity control number, or local stock number specified in the contract. If these are not present, enter the Federal Supply Schedule Special Item Number for the item.

3.4.3 Where applicable, the specification reference including specification number, type, grade and class.

3.4.4 The date of preparation of the MSDS.

3.4.5 The name, address and telephone number of the manufacturer, importer or other responsible party preparing the MSDS who can provide additional information on the hazardous product and appropriate emergency procedures.

3.4.6 The product identity (part number, trade name, etc) used on the label and packing list.

3.4.7 The chemical and common name(s) and percentage of composition of all ingredients which have been determined to be health hazards or to present a physical hazard when present in the product (carcinogens - 0.1 percent or greater by volume, other hazardous ingredients - 1.0 percent or greater by volume).

3.4.8 For each hazardous ingredient, the OSHA permissible exposure limit, ACGIH Threshold Limit Value, and any other exposure limit used or recommended by the manufacturer, importer, or employer preparing the MSDS, where available.

3.4.9 The physical and chemical characteristics of the hazardous product (melting point, boiling point, evaporation rate, vapor pressure, vapor density, specific gravity, solubility in water, percent volatile by volume, viscosity, pH, autoignition temperature, decomposition temperature, magnetism, corrosion rate, flash point and flash point method, lower explosive limit, and upper explosive limit).

3.4.10 The physical hazards of the hazardous product, including the potential for fire, explosion, and reactivity.

3.4.11 The health hazards of the hazardous product, including signs and symptoms of exposure, and any medical conditions which are generally recognized as being aggravated by exposure to the product.

3.4.12 The primary route(s) of entry.

3.4.13 Whether the hazardous product is listed in the National Toxicology Program (NTP) Annual Report on Carcinogens (Latest edition) or has been found to be a potential carcinogen on the International Agency for Research on Cancer (IARC) Monographs (latest editions), or by OSHA.

3.4.14 Any generally applicable precautions for safe handling and use which are known to the manufacturer, importer or employer preparing the MSDS, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks.

3.4.15 Any generally applicable control measures which are known to the manufacturer, importer or employer preparing the MSDS, such as appropriate engineering controls, work practices or personal protective equipment.

3.4.16 Emergency and first aid procedures.

3.4.17 Shipping regulation applicable to the product (see section 2).

3.4.17.1 Proper shipping name from this regulation.

3.4.17.2 Hazard Class for the material from this regulation.

3.4.17.3 Label required on outside shipping container by this regulation.

3.4.18 Whether the item may be sent through the mail and any precautions required by US Postal Service Regulations.

3.4.19 Disposal information. If the item would be classified as hazardous waste under Federal regulations, give the EPA Hazardous Waste Number/Code, the hazardous waste characteristics (ignitability, corrosivity, reactivity, EP toxicity), and the disposal methods.

4. Material safety data sheet receipt points. In addition to any other MSDS requirements in the contract, contractors shall submit one copy of each MSDS to the address indicated below for the Service/Agency/GSA Commodity Center which procured the item.

Procuring Service/Agency	MSDS receipt point
Air Force:	USAF Occupational and Environmental Health Lab/ECH Brooks, AFB, TX 78235-5000
Army:	Commander U.S. Army Material Command Catalog Data Activity ATTN: AMXCA-DA New Cumberland, PA 17010-5010

Service/Agency	MSDS receipt point
Defense Logistics Agency:	Commander Defense General Supply Center ATTN: DGSC-SLM Richmond, VA 23297-5000
Defense Mapping Agency:	Director Defense Mapping Agency U.S. Naval Observatory Building 56 Washington, DC 20305-3000
GSA - General Products Commodity Center:	GSA - FSS General Products Commodity Center Engineering Division (7FXEE) ATTN - HMIS 819 Taylor Street Fort Worth, TX 76102
GSA - Office and Scientific Equipment Commodity Center:	GSA - FSS Office and Scientific Equipment Commodity Center Engineering Division (FCGC) ATTN - HMIS Washington, DC 20406
GSA - Office Supplies and Paper Products Commodity Center:	GSA - FSS Office Supplies and Paper Products Commodity Center Engineering Division (2FYE) ATTN - HMIS 26 Federal Plaza New York, NY 10278
GSA - Paints and Chemicals Commodity Center:	GSA - FSS Paints and Chemicals Commodity Center Engineering Division (9FTE-10) ATTN - HMIS GSA Center Auburn, WA 98001
Marine Corps:	Navy Environmental Health Center ATTN: HMIS Code 42 Bld. X 353, Naval Station Norfolk, VA 23511-6695

Service/Agency	MSDS receipt point
National Aeronautics and Space Administration:	National Aeronautics and Space Administration Occupational Health Office Code NPG Washington, DC 20546
National Security Agency:	Director National Security Agency Central Security Service ATTN: CODE L542 Ft. George G. Meade, MD 20756-6000
Navy:	Navy Environmental Health Center ATTN: HMIS Code 42 Bld. X 353, Naval Station Norfolk, VA 23511-6695
Postal Service:	United States Postal Service Office of Safety and Health Safety Management Division 475 L'Enfant Plaza West, S.W. Washington, DC 20260
Tennessee Valley Authority:	Tennessee Valley Authority Division of Occupational Health and Safety 323 Multipurpose Building Muscle Shoals, AL 35660
U.S. Coast Guard:	Commandant (G-CSP) United States Coast Guard 2100 2nd Street, SW Washington, DC 20593-0001
Veterans Administration:	Submit to the Facility Safety Official at the Veterans Administration facility contracting for the item

5. Recommendations for changes and improvement. Recommendations for changes and improvement of this standard shall be forwarded to the General Services Administration, Federal Supply Service, Item Management Division, Washington DC 20406. Military activities shall submit their recommendations through the appropriate Department custodian and the Military Coordinating Activity.

APPENDIX A - Identification of Hazardous Items by Federal Supply Class(FSC)

10. FSC identification of hazardous items. Any FSC could contain a hazardous item. The listings in table I and table II are not intended to be inclusive listings of all hazardous items, but to identify the major classes which contain hazardous items and provide examples of hazardous items in other classes.

10.1 FSC's in which most items are hazardous. An MSDS shall be submitted for all items in the FSC's listed in table I.

Table I - MSDS required for all items.

FSC	TITLE
6810	Chemicals
6820	Dyes
6830	Gases: Compressed and liquefied
6840	Pest Control Agents and Disinfectants
6850	Miscellaneous Chemical Specialties
7930	Cleaning and Polishing Compounds and Preparations
8010	Paints, Dopes, Varnishes, and Related Products
8030	Preservative and Sealing Compounds
8040	Adhesives
9110	Fuels, Solid
9130	Liquid Propellants and Fuels, Petroleum Base
9135	Liquid Propellant Fuels and Oxidizers, Chemical Base
9140	Fuel Oils
9150	Oils and Greases: Cutting, Lubricating, and Hydraulic
9160	Miscellaneous Waxes, Oils and Fats

10.2 Other FSC's. An MSDS shall be submitted for the hazardous items (as defined in paragraph 3.3) in FSC's not listed in table I. Some examples of hazardous items in other FSC's are listed in table II.

Table II - Examples of hazardous items in other FSC's.

FSC	TITLE	EXAMPLES OF HAZARDOUS ITEMS
1370	Pyrotechnics	Warning fusee, fire starter
1375	Demolition Materials	Explosive devices
1560	Airframe Structural Components	Radioactive materials
1630	Airframe Wheel and Brake System	Items containing asbestos
2240	Locomotive and Rail Car Accessories	Items containing asbestos
2520	Vehicular Power Transmission Components	Items containing asbestos
2530	Vehicular Brake Steering, Axle, Wheel, and Track Components	Items containing asbestos
2540	Vehicular Furniture and Accessories	Items containing asbestos
2640	Tire Rebuilding and Tire and Tube Repair Materials	Items containing flammable or toxic compounds
3433	Gas Welding, Heat Cutting, and Metalizing Equipment	Compressed gases
3439	Miscellaneous Welding, Soldering, and Brazing Supplies and Accessories	Hazardous items such as cleaners, acids, flux and supplies containing or producing hazardous fumes

Table II (continued)

FSC	TITLE	EXAMPLES OF HAZARDOUS ITEMS
3610	Printing, Duplicating, and Bookbinding Equip.	Flammable or toxic lithographic solutions
3655	Gas Generating and Dispensing Systems, Fixed or Mobile	Those items producing hazardous fumes
3680	Foundry Machinery, Related Equipment and Supplies	Flammable or toxic casting compounds
4210	Fire Fighting Equipment	Extinguishing agents, repair and refill kits containing hazardous chemicals
4240	Safety and Rescue Equipment	Those items that release oxygen, or contain compressed gases or initiating charges
5330	Packing and Gasket Material	Asbestos material, lead caulking
5340	Misc. Hardware Equipment	Strapping and sealing kits containing hazardous chemicals
5350	Abrasive Material	Dust producing items which may produce a hazardous waste
5430	Storage Tanks	Repair kits containing hazardous chemicals
5610	Mineral Construction Materials, Bulk	Hazardous items such as cutback asphalt, deck and floor covering, deck and surface underlay compounds, sealing compounds, flight deck compounds
5640	Wallboard Building Paper, and Thermal Insulation Materials	Asbestos cloth having loose fibers or flyings that may become airborne, and materials containing formaldehyde

Table II (continued)

FSC	TITLE	EXAMPLES OF HAZARDOUS ITEMS
5680	Misc. Construction Material	Repair kits containing hazardous chemicals
5820	Radio and Television Communication Equipment, except Airborne	Those circuit cooler items containing gases that are regulated as hazardous to the earth's ozone layer
5835	Sound Recording and Reproducing Equipment	Those recording tape cleaners containing hazardous cleaning fluids or packaged in pressurized containers
5910	Capacitors	Those items containing Polychlorinated Biphenyls (PCBs)
5915	Filters and Networks	Those items containing Polychlorinated Biphenyls (PCBs)
5920	Fuses and Lighting Arresters	Those items containing radioactive materials
5925	Circuit Breakers	Those items containing radioactive materials
5930	Switches	Those items containing radioactive materials
5935	Connectors, Electrical	Those kits containing flammable chemicals
5950	Coils and Transformers	Those items containing Polychlorinated Biphenyls (PCBs)
5960	Electron Tubes and Associated Hardware	Those tubes containing radioactive isotopes and requiring warning labels and magnetron tubes that require special precautions when being prepared for air shipment

Table II (continued)

FSC	TITLE	EXAMPLES OF HAZARDOUS ITEMS
5965	Headsets, Handsets, Microphones, and Speakers	Those items containing magnetic materials
5970	Electrical Insulators and Insulating Materials	Those items containing flammable solvents
5975	Electrical Hardware and Supplies	Those items containing asbestos
5985	Antennas, Waveguide, and Related Equipment	Those kits containing flammable chemicals
5999	Miscellaneous Electrical and Oxide Electronic Compounds	Those contact plates containing Beryllium
6135	Batteries, Primary	Lithium and mercury batteries and alkaline (with electrolyte)
6140	Batteries, Secondary	Those wet or moist items containing lead-acid, nickel-cadmium, corrosive or other hazardous compounds
6220	Electric Vehicular Lights and Fixtures	Those items containing mercury
6230	Electric Portable and Hand Lighting Equipment	Those items containing wet batteries
6240	Electric Lamps	Those items containing mercury
6260	Nonelectrical Lighting Fixtures	Those items containing mercury or radioactive materials

Table II (continued)

FSC	TITLE	EXAMPLES OF HAZARDOUS ITEMS
6350	Miscellaneous Alarm, Signal, and Security Detection Systems	Those items containing wet batteries or radioactive materials.
6505	Drugs, Biologicals, and Official Reagents	Hazardous items as defined in paragraph 3.3.
6508	Medicated Cosmetics and Toiletries	Hazardous items as defined in paragraph 3.3
6510	Surgical Dressing Materials	Items containing flammable solvents
6520	Dental Instruments, Equipment, and Supplies	Items containing flammable solvents, mercury or asbestos
6525	X-ray Equipment and Supplies: Medical, Dental, Veterinary	Items containing hazardous chemicals, solvents or radioactive materials
6545	Replenishable Field Medical Sets, Kits, Outfits	Items containing hazardous chemicals
6550	In Vitro Diagnostic Substances, Reagents	Items containing hazardous chemicals
6605	Navigational Instruments	Radioactive materials
6625	Electrical and Electronic Properties Measuring and Testing Instruments	Those items containing radioactive materials
6640	Laboratory Equipment and Supplies	Items containing flammable compounds, mercury or asbestos
6665	Hazard-Detecting Instruments	Test kits and repair kit reagents containing hazardous chemicals

Table II (continued)

FSC	TITLE	EXAMPLES OF HAZARDOUS ITEMS
6675	Drafting, Surveying and Mapping Instruments	Items with hazardous chemicals
6685	Pressure, Temperature, and Humidity Measuring and Controlling Instruments	Items containing mercury or compressed gases
6740	Photographic Developing and Finishing Equipment	Those items containing radioactive compounds
6750	Photographic Supplies	Items containing hazardous chemicals, solvents, thinners and cements
6780	Photographic Sets, Kits, and Outfits	Items containing hazardous chemicals, solvents, thinners and cement
7360	Sets, Kits, and Outfits: Food Preparation and Serving	Items containing compressed gases such as fire extinguishers
7510	Office Supplies	Hazardous items such as solvents, thinners, cleaning fluids, flammable inks and varnishes
7530	Stationary and Record Forms	Items containing hazardous chemicals or chemicals which off-gas
8405	Outerwear, Men’s	Those maintenance kits containing flammable solvents
8410	Outerwear, Woman’s	Those maintenance kits containing flammable solvents
8415	Clothing, Special Purpose	Those maintenance kits containing flammable solvents
8465	Individual Equipment	Those maintenance kits containing flammable solvents

Table II (continued)

FSC	TITLE	EXAMPLES OF HAZARDOUS ITEMS
8510	Perfumes, Toilet Preparations, and Powders	Shipping containers, and pressurized containers with flammable or nonflammable propellants
8520	Toilet Soap, Shaving Preparations, and Dentifrices	Shipping containers, pressurized containers with flammable or nonflammable propellants
8720	Fertilizers	Items containing herbicides and/or insecticides, or that are hazardous because of their composition
9330	Plastic Fabricated Materials	Items containing flammable solvents or toxic materials such as isocyanates
9620	Mineral, Natural, Synthetic	Asbestos, mica, silica, other hazardous chemicals
9630	Additive Metal Materials and Alloys	Various hazardous chemicals
9390	Miscellaneous Fabricated Non-metallic Materials	Those items containing flammable solvents or asbestos
9920	Smokers' Articles and Matches	Lighter fuel and matches.
9930	Memorials; Cemeterial and Mortuary Equipment and Supplies	Those items containing formaldehyde or its solutions

APPENDIX B - Instructions for filling out the MSDS.

20. Instructions for filling out the MSDS. These instructions apply to all MSDS's submitted. The data elements are listed in the order they appear in Alternate Form A (see Figure 1).

20.1 General Instructions.

20.1.1 Decimal fractions. When a number less than 1.0 is given, a "0" shall be entered to the left of the decimal (e.g., 0.895 instead of .895). This is essential for the prevention of clerical errors.

20.1.2 Negative answers. The phrase "NOT APPLICABLE" shall be entered if the preparer of the data sheet has determined that a particular data element does not apply to the product. If the preparer has determined that the phrase "NOT APPLICABLE" is not an appropriate entry for a particular data field and has researched the available scientific literature such as that listed in Appendix C of 29 CFR 1900.1200 and has not found any information, then the phrase "NO INFORMATION FOUND" will be entered. All blocks on the MSDS shall be completed with the appropriate data or with one of the two phrases given above.

20.1.3 Temperatures. All temperatures shall be given in degrees Fahrenheit followed in parentheses by the equivalent temperature in degrees Centigrade.

20.2 Product Identity Section.

20.2.1 Commercial Identity. The manufacturer's part number, trade name and any other identification as given on the product label and packing list.

20.2.2 NRC License Number. The Nuclear Regulatory Commission License Number for radioactive materials. If the NRC has not issued one, a state license number may be entered here.

20.2.3 EPA Registration Number. The EPA Registration Number for pesticides.

20.2.4 Government Contract/Order Number. The contract number assigned by the specific Government agency procuring the item. The entire contract number including the branch designator (e.g., GSA, DLA) shall be given.

20.2.5
National Stock Number. Activity Control Number, Local Stock Number. Special Item Number. This is the number/designation which identifies the product in the contract/order. The national stock number(NSN) is the 13 digit identification number assigned by the Federal Cataloging System. The activity control number(ACN) or local stock number(LSN) is the stock number that is locally assigned by an individual Government activity to identify an item when an NSN is not used. The NSN or the ACN/LSN are referenced in the contract and must be placed on the MSDS for complete identification purposes. For Federal Supply Schedule items which have no NSN/ACN/LSN, the schedule identification and special item number under which the item is

listed in the schedule shall be entered in this block. For example, special item number 536-1 under Federal Supply Schedule FSC 80 Part VI Section A would be entered 80-VI-A-536-1.

20.2.6 Specification. The specification under which the item was procured. The revision indicator of the specification should be included (e.g. MIL-G-10924D, TT-L-50G).

20.2.7 Type, grade, class. The classification of the item under the purchase specification (type, grade, style, class, etc.) essential to properly associate the information provided on this sheet with the actual item supplied to the Government.

20.3 Section I - General Information

20.3.1 Hazardous Item. Check Yes or No to indicate whether the item is or is not hazardous as defined in paragraph 3.3. If the item is not hazardous it will not be necessary to complete Sections II through IX.

20.3.2 Type of Data Sheet. Check the square to indicate if this is a new or revised MSDS.

20.3.3 Manufacturer’s Commercial and Government Entity(CAGE) Code. This is a 5-position code assigned to any contractor who does business with the Government. The code is assigned by the Defense Logistics Service Center, Battle Creek, MI.

20.3.4 Manufacturer’s Name. The name under which the company does business. Include any divisions if applicable.

20.3.5 Manufacturer’s Address. Mailing address, including number, street, city, state and zip code.

20.3.6 Emergency Telephone Number. The area code and telephone number that a Federal Agency can call for instructions in case of an emergency involving the product. The hours and days of the week of operation for the phone number shall also be included.

20.3.7 Telephone Number for Information. The telephone number that a Federal Agency can call for information about the hazardous properties of the product and to obtain further health/safety information. The hours and days of the week of operation for the phone number shall also be included.

20.3.8 Date Prepared. The date the MSDS was prepared.

20.3.9 Name of Preparer. The typed or clearly printed name of the person preparing the MSDS.

20.3.10 Signature of Preparer. The signature of the person preparing the MSDS (optional).

20.4 Section II - Hazardous ingredients/Identity Information. The following information shall be provided for each hazardous component of the item.

20.4.1 NIOSH Identification Number. This is the accession or identification number referenced in the Registry of Toxic Effects of Chemical Substances. It is used to precisely identify the chemical. It must be given whenever a chemical ingredient is given. Also include the Chemical Abstract Service (CAS) Number if one has been assigned. Leave this field blank only when an accession number has not been assigned by NIOSH and there is no CAS number.

20.4.2 Name of Hazardous Ingredient.

20.4.2.1 Non-Radioactive Materials. Enter the precise chemical name(s) of the hazardous ingredient(s) in this field. The specific chemical name(s) for a single chemical substance and for the ingredients of hazardous chemical mixtures which contribute to the known hazards of such mixtures shall follow the nomenclature convention used by the International Union of Pure and Applied Chemistry (IUPAC). Do not use general terms such as "acids" or "gases." Knowledge of the exact nature of the chemical is very important in determining emergency response procedures. For those items where it is appropriate, such as paints or preservatives, a term such as pigment, catalyst, vehicle or solvent, etc., shall be stated after the chemical name of the ingredient. In addition to the precise chemical name, the common name(s) of the single hazardous chemical, chemical mixture and/or ingredients shall also be shown in this field. For trade secret or proprietary information, the specific chemical information must be given. Indicate proprietary on the ingredient section of the MSDS. This information will be kept confidential with limited access for government use.

20.4.2.2 Radioactive Materials. For radioactive materials enter the radionuclide, form and the radioactivity per item.

20.4.2.2.1 Form. Specify if the radioactive material is in a normal or special form as defined in 49 CFR 173.403(s) or 173.403(z). Also specify the physical state of the radioactive material as gas, liquid or solid. Specify the data as follows:

Normal - Solid
Normal - Liquid
Normal - Gas
Special - Solid
Special - Liquid
Special - Gas

20.4.2.2.2 Radioactivity. The quantity of radioactive material present in the item. Specify the units of measurement such as CI for curies or UCI for microcuries.

20.4.3 OSHA Permissible Exposure Limit. Enter the permissible exposure limit established by the Occupational Safety and Health Administration (OSHA) in 29 CFR 1910 for the ingredient. The units shall be specified.

20.4.4 ACGIH TLV. Enter the ACGIH Threshold Limit Value (TLV) for the ingredient listed. The TLV refers to the current values set by the American Conference of Governmental Industrial Hygienists. Express these values in millions of particles per cubic foot of air (mppcf) or in milligrams of particulate per cubic meter of air (mg/m) for dust; in milligrams of particulate per cubic meter of air (mg/m) for mists and fumes; or in parts per million parts of air by volume (ppm) for gases and vapors. Values for asbestos or other fibrous material shall be expressed in fibers (greater than 5 micrometers in length with an aspect ratio >3:1) per cubic centimeter of air (f/cc). State the unit in which the TLV is expressed.

20.4.5 Other Exposure Limits. Enter any exposure limits for the ingredient used or recommended by the chemical manufacturer. importer or employer preparing the MSDS. The units shall be shown and shall be the same as those used for the OSHA PEL and ACGIH TLV.

20.4.6 Percentage. Enter the actual percentage of composition of all ingredients that are health hazards or physical hazards (1 percent or greater by volume) or carcinogens (0.1 percent or greater by volume). The approximate percentage for other ingredients by weight or volume (specify) shall be shown to the nearest 5 percent. For mixtures, such as filler metals and their coatings and core fluxes in which the ingredients constitute very small proportions of the mixture, the ingredients shall be stated to the nearest 0.5 percent and the ingredients constituting less than 0.5 percent may be indicated as such.

20.5 Section III - Physical/Chemical Characteristics

20.5.1 Freezing (Melting) Point. The temperature at which the liquid and solid phases of a given substance exist in equilibrium is called the freezing point of the liquid or melting point of the solid. The terms may be used interchangeably. The temperature shall be expressed in degrees F and degrees C.

20.5.2 Boiling Point. State the temperature at which the liquids boil, in degrees F and degrees C, at a pressure of 760 mm Hg. For mixtures, a boiling range is acceptable.

20.5.3 Evaporation rate. State the ratio of the evaporation rate to that of either butyl acetate or diethyl ether. Insert the name of the reference material used.

20.5.4 Vapor Pressure. The pressure (usually expressed in millimeters of mercury) characteristic at 68 degrees F (20 degrees C) of vapor in equilibrium with its liquid or solid form. If the data are only available

at a temperature other than 20 degrees C, specify the temperature at which the measurement was taken.

20.5.5 Vapor Density. State the relative density or weight of a vapor or gas (with no air present) compared with an equal volume of air. Specify the temperature (degrees F or degrees C) at which the vapor density is determined.

20.5.6 Appearance and Odor. Give a brief description of the physical appearance and characteristic odor. Example: Viscous, colorless, liquid with smell of rotten eggs.

20.5.7 Specific Gravity. State the ratio of weight of a volume of material to the weight of an equal volume of water at 68 degrees F (20 degrees C). This determines whether the material floats or sinks in water. If the data are only available at a temperature other than 20 degrees C, specify the temperature at which the measurement was taken.

20.5.8 Solubility in Water. Enter the solubility as a weight percent (grams product/grams solution) of the product in distilled water at 68 degrees F (20 degrees C.). If the data are only available at a temperature other than 20 degrees C, specify the temperature at which the measurement was taken.

Alternatively, the solubility may be described by the following qualitative terms:

Negligible.	Less than 0.1 percent
Slight	0.1 - 1 percent
Moderate	1 - 10 percent
Appreciable	More than 10 percent
Complete	in all proportions

20.5.9 Percentage Volatile by Volume. State the percentage of the liquid or solid by volume that evaporates at ambient temperature of 68 degrees F (20 degrees C). This also applies to solids such as naphthalene. If the data are only available at a temperature other than 20 degrees C, specify the temperature at which the measurement was taken.

20.5.10 Viscosity. Enter the viscosity of fluid products, the units of measurement and the temperature at which the viscosity was measured. This is the internal resistance to flow exhibited by a fluid.

20.5.11 pH. Enter the pH of aqueous solutions. This is the value used to represent the acidity or alkalinity of an aqueous solution. It is defined as the common logarithm of the reciprocal of the hydrogen ion concentration of a solution.

20.5.12 Autoignition Temperature. Enter the autoignition temperature in degrees F and degrees C. The minimum temperature required to initiate or cause self-sustained combustion in any substance in the absence of a spark or flame.

20.5.13 Decomposition Temperature. The temperature (degrees F and degrees C) at which the material transforms into one or more other substances by heating, burning, etc.

20.5.14 Magnetism. When applicable, enter the magnetic field strength of the product in milligauss.

20.5.15 Corrosion Rate. An indication shall be given as to whether or not the material is corrosive to metals. Give the corrosion rate in inches per year and specify the temperature at which the rate is applicable and the material on which the test was performed. (Refer to 49 CFR 173.240 for specific temperature and materials.)

20.6 Section IV - Fire and Explosion Hazard Data.

20.6.1 Flashpoint. State the temperature (degrees F and degrees C), and the test method used, at which a liquid will give off enough flammable vapor to ignite when tested by the closed cup (CC) method. When multi-component paint systems are used and mixed in the field, the flashpoint of the individual components shall be noted. The open cup (OC) temperature may be given only when the CC temperature is not available. Flash point test methods approved for use by 49 CFR shall be used.

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

20.6.3 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 shall be indicated by generic name. The standard firefighting agents are: Water fog, foam, alcohol foam, CO_2, and dry chemical.

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

20.6.5 Unusual Fire and Explosion Hazards. Enter unusual fire and explosion hazards and the special conditions that govern them. Example: the product is under pressure and may explode if exposed to fire.

20.7 Section V - Reactivity Data.

20.7.1 Neutralizing Agent. Enter the safest, most effective material that can be used to neutralize corrosive materials and others.

20.7.2 Stability. Indicate by cross or check whether stable or unstable under reasonably foreseeable conditions of storage, use or misuse.

20.7.3 Conditions to Avoid (Stability). If the product is unstable, list those conditions that may cause a dangerous reaction. Examples: shook from dropping, temperature above 150 degrees F (65 degrees C), etc.

20.7.4 Incompatibility (Materials to Avoid). List materials and contaminants with which the product would react to release large amounts of energy. List those materials, containers and contaminants to which the product might reasonably be expected to be exposed to during transportation, storage and use, if appropriate precautions are not taken. If none is known, enter "NONE KNOWN". State whether the material to be avoided is an oxidizing material, acid, caustic alkali or corrosive. Identify container materials that will react and therefore must not be used.

20.7.5 Hazardous Decomposition Product. List hazardous materials produced in dangerous amounts by burning, oxidation, or heating in welding or burning. Thermal decomposition products such as carbon monoxide, carbon dioxide, and hydrochloric acid from vinyl chloride plastics serve as examples. Also specify any hazardous products formed as a result of aging. An example is ether, which can decompose into unstable peroxides with age. Any special handling or storage precautions to be taken to avoid the above mentioned hazards shall be specified in the Precautions for Safe Handling and Use section.

20.7.6 Hazardous Polymerization. Hazardous polymerization is that which takes place at a rate that releases large amounts of energy. Indicate by check or cross whether or not hazardous polymerization can occur.

20.7.7 Condition to Avoid (Polymerization). If hazardous polymerization can occur, list those reasonably foreseeable storage conditions that would start polymerization. Include the expected time period in which the inhibitors may be used up.

20.8 Section VI - Health Hazard Data.

20.8.1 The Primary Route(s) of Entry. Specify the primary route(s) of entry into the body such as topical (skin contact), ingestion (gastrointestinal tract) or inhalation (lungs).

20.8.2 Effects of (Acute and Chronic) Overexposure. List all the symptoms that an individual might experience as a result of acute or chronic overexposure. Examples are nausea, headache, vomiting, shortness of breath, gastrointestinal pain, dermatitis, diarrhea, dizziness, loss of appetite, etc. Specify if the symptoms are the result of skin contact, ingestion or inhalation. Specify the target organs affected. Also state if the item can potentially cause cancer.

20.8.3 Cancer Causing Agent. State whether any of those ingredients listed under 20.4 are listed in the National Toxicology Program (NTP) Annual Reports on Carcinogens (latest edition) or have been found to be a potential carcinogen in the International Agency for Research on Cancer

(ARC) Monographs (latest editions), or have been found to be a carcinogen by the Occupational Safety and Health Administration (OSHA).

20.8.4 Signs and Symptoms of Exposure. List all the signs and/or symptoms that an individual might experience as a result of the exposure and/or overexposure to the product. Examples are nausea, headache, vomiting, shortness of breath, gastrointestinal pain, dermatitis, diarrhea, dizziness, loss of appetite, etc. Specify if the symptoms are the result of skin contact, eye contact, ingestion or inhalation.

20.8.5 Medical Conditions Generally Aggravated by Exposure. List all medical conditions which are generally recognized as being aggravated by exposure to the product.

20.8.6 Emergency and First-Aid Procedures. State the emergency procedures to be followed upon exposure or overexposure to the item. Inhalation, skin or eye contact and oral ingestion shall be considered in recommending first-aid procedures.

20.9 Section VII - Precautions for Safe Handling and Use.

20.9.1 Steps To Be Taken in Case Material is Released or Spilled. Enter the steps to be taken on an emergency basis to control a spill or leak. These procedures shall include any applicable precautions for the avoidance of breathing gases and vapors; contact with liquids and solids; removing sources of ignition; and special equipment and personal protective equipment required for cleaning up, such as glass or plastic scoops, sorbent materials, respiratory devices, gloves, etc. Also indicate what is considered the reportable quantity for spills under federal regulations.

20.9.2 Waste Disposal Method. Enter in this field the approved method of disposing of spilled or leaked material. Describe what shall be done with the spilled or leaked material, including any sorbent materials used to control the spill or leak. It includes instructions on what steps are necessary to containerize the product and to get it into a non-emergency status. It is generally not intended for long-range ultimate disposal methodology because such instructions are often long and complex and shall be addressed in a separate format. If long range ultimate disposal methodology is known, provide as a separate attachment. All disposal procedures must comply with local, state and Federal regulations.

20.9.3 Precautions to be Taken in Handling and Storage. This field includes any special precautions to be taken in storage and handling to avoid any reaction hazards. When applicable, indicate safe storage life of product in relation to reactivity. Specify any storage or handling precautions to be taken to avoid any hazards associated with the aging of the product. Other general precautions to be taken shall be included. This section also can be used to identify any special equipment that is required for transfer or storage.

20.9.4 Other Precautions. This section includes any unique additional precautions that must be taken for the material.

20.10 Section VIII - Control Measures.

20.10.1 Respiratory Protection (Specify Type). When applicable, enter the type of respiratory protection required to be worn by workers. This refers to personal protective equipment used to protect the worker from inhalation of contaminated atmosphere. Examples are chemical cartridge respirators, dust respirators, self-contained breathing apparatus, etc.

20.10.2 Ventilation. When applicable, enter the type of ventilation and any specific equipment required. The basic ventilation methods are dilution or general ventilation and local exhaust. Dilution or general ventilation consists of general ventilation of a workroom so designed that the contaminants released into the atmosphere are continuously diluted by the introduction of uncontaminated air to levels at which a worker can safely work for 8 hours a day. It is usually applied to the control of low toxicity contaminants. A local exhaust system is used to carry off an air contaminant by trapping it near its source. Specify the type of ventilation and any specific equipment necessary to accomplish this.

20.10.3 Protective Gloves. When applicable, enter the type of gloves required to protect the hands and forearms of workers. These are gloves that are use to protect personnel against the handling of corrosive and/or toxic materials such as acids or other hazardous materials that can have a deteriorating effect on the human skin/body tissue by skin absorption. The material of the gloves must be suitable for the exposure to the specific chemical(s) that may be encountered.

20.10.4 Eye Protection. Enter the eye protection equipment that should be worn by workers to protect the eyes against chemical splashes, chipping, welding, and other eye-hazardous jobs. Examples include industrial safety glasses, chemical goggles, full-length face shields, etc.

20.10.5 Other Protective Clothing or Equipment. Enter additional equipment that should be worn by the worker to prevent exposure or contact with hazardous chemicals. Examples include suits or boots made of natural rubber, neoprene, or vinyl; safety shoes; hearing protection; hardhats, etc.

20.10.6 Work/Hygienic Practices. Those work practices which should be followed to minimize exposure to the product. Examples include washing hands before eating or smoking.

20.11 Section IX - Transportation.

20.11.1 Applicable Regulations. Indicate by cross or check the applicable shipping regulation from which the shipping name, class and label below are taken. This is normally the mode of transportation used to ship the item from the manufacturer/contractor to the customer.

20.11.2 Shipping Name. Indicate the proper shipping name for the material. The shipping name will be from the regulation that is entered in paragraph 20.11.1 above.

20.11.3 Identification Number. Indicate the identification number specified for the above shipping name in 49 CFR 172.101 or the United Nations identification number if international shipping regulations are used.

20.11.4 Reportable Quantity. Indicate if the item is a reportable quantity (hazardous substances) as defined in 49 CFR 171.8. The determination of reportable quantity should be based on the size of the package as it is normally sold. A "YES" or "NO" entry is sufficient.

20.11.5 Hazard Class. Indicate the hazard class or the numeric class or division as required for the material. This class will be from the regulation that is entered in paragraph 20.11.1 above.

20.11.6 Labels. Indicate the label(s) to be placed on the outside shipping container. If labels are not required, enter "NONE". This will be the label required by the regulation entered in 20.11.1 above.

20.11.7 Unit Container. This is the container in immediate contact with the product (e.g., 1-pint metal can, 1-gallon polyethylene bottle, 1-pound paper bag, 55-gallon metal drum, 12-ounce aerosol can, etc.). State the material of construction and capacity by weight or volume of the container.

20.11.8 DOT Specification Container. When applicable, give the number of the DOT Specification Container of the unit container (e.g., DOT 2U, DOT 5B etc.) or the authorized UN container designation (e.g. 4G, 1A1, etc.).

20.11.9 DOT Exemption Number/Department of Defense (DoD) Certification Control Number (CCN). When applicable, give the DOT Exemption Number or the DoD Certification Control Number under which the product is shipped.

20.11.10 Net Explosive Weight. Enter by class the total net explosive weight of all active Class A, B and C explosives. This will include primary explosives, secondary explosives, pyrotechnics, and propellants.

20.11.11 Limited Quantity. Indicate if the item is a limited quantity as defined in 49 CFR 171.8. A "YES" or "NO" entry is sufficient.

20.11.12 Aerosol Propellant(s). When applicable give the chemical name of any aerosol propellants used in the product. This chemical will also appear in the ingredients section (section II) of the MSDS.

20.11.13 US Postal Service Regulations. Indicate whether the item may be sent through the mail and any applicable precautions that must be taken.

20.12 Disposal Information (attach to MSDS). If the item would be classified as hazardous waste under 40 CFR, provide the following information.

20.12.1 EPA Hazardous Waste Number/Code.

20.12.2 Hazardous Waste Characteristics. The characteristics of the hazardous waste (ignitability, corrosivity, reactivity, EP toxicity).

20.12.3 Disposal methods. The approved methods of disposal of the item.

MILITARY INTEREST:

Military Coordinating Activity

DLA-DH

Custodians

Army - MD
Navy - SA
Air Force - 07

Review Activities

Army - SM
Navy - MS, AS, SH
Air Force - 43
DLA - GS

CIVIL AGENCY COORDINATING ACTIVITIES:

COMMERCE-CPS
EPA
GSA-FSS
HHS-NIH
OSHA

PREPARING ACTIVITY:

GSA-FSS

RESERVED

Alternate Form A is under revision and will be published separately.

RESERVED

Figure 1. Alternate Form A (Front)

RESERVED

Figure 1. Alternate Form A (Back)

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY *(As Used on Label and List)*

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name	Emergency Telephone Number
Address *(Number, Street, City, State, and ZIP Code)*	Telephone Number for Information
	Date Prepared
	Signature of Preparer *(optional)*

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% *(optional)*

Section III — Physical/Chemical Characteristics

Boiling Point		Specific Gravity (H_2O = 1)	
Vapor Pressure (mm Hg.)		Melting Point	
Vapor Density (AIR = 1)		Evaporation Rate (Butyl Acetate = 1)	

Solubility in Water

Appearance and Odor

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL

Extinguishing Media

Special Fire Fighting Procedures

Unusual Fire and Explosion Hazards

(Reproduce locally)

Figure 2. OSHA Form 174 (Front)

OSHA 174, Sept. 1985

Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable		

Incompatibility (*Materials to Avoid*)

Hazardous Decomposition or Byproducts

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur		

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? Skin? Ingestion?

Health Hazards (*Acute and Chronic*)

Carcinogenicity: NTP? IARC Monographs? OSHA Regulated?

Signs and Symptoms of Exposure

Medical Conditions
Generally Aggravated by Exposure

Emergency and First Aid Procedures

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled

Waste Disposal Method

Precautions to Be Taken in Handling and Storing

Other Precautions

Section VIII — Control Measures

Respiratory Protection (*Specify Type*)

Ventilation	Local Exhaust	Special
	Mechanical (*General*)	Other

Protective Gloves	Eye Protection

Other Protective Clothing or Equipment

Work/Hygienic Practices

Figure 2. OSHA Form 174 (Back)