

HOW TO READ A SAFETY DATA SHEET

OSHA Brief:

OSHA requires that the chemical manufacturer, distributor, or importer provide Safety Data Sheets (SDSs) for hazardous chemicals. OSHA requires that each hazardous chemical to be transported must be accompanied by an SDS. The information contained in the SDS is largely the same as the MSDS, except that the SDS is required to be provided in a condensed user-friendly, 28-section format. This new format provides guidance to help workers who handle hazardous chemicals to become familiar with the format and understand the contents of the SDSs.

The SDS requires information on the physical, chemical, and safety hazards of the chemical, and on environmental health hazards, protective measures, and safety procedures for handling, storing, and transporting the chemical. The information contained in the SDS is organized into 28 sections. The first 16 sections (Sections 1 through 16) are required by OSHA. Sections 17 through 19 are optional. Sections 20 through 28 are optional. OSHA requires that SDSs prepared provide specific minimum information as detailed in Appendix C-2 of 29 CFR (29 CFR 1910.1200). The SDSs prepared may also include additional information as desired.

Sections 1 through 8 contain general information about the chemical, identification, hazards, composition, safe handling practices, and emergency control measures (e.g., first aid). This information should be helpful to those that need to get the information quickly. Sections 9 through 11, and 28 contain other technical and scientific information such as physical and chemical properties, stability and reactivity information, toxicology, and environmental data. Sections 12 through 27 contain information about the date of preparation of the SDS. The SDSs must also state that no applicable information was found when the preparer does not find relevant information for any chemical.

The SDSs must also contain Sections 12 through 27, to be consistent with the GHS Globally Harmonized System of Classification and Labeling of Chemicals (GHS), but OSHA will not enforce the content of these sections because they contain information that is not required by OSHA. A description of all 28 sections of the SDS, along with their contents, is presented below.

Section 1: Identification

This section identifies the chemical on the SDS as well as the recommended use. It also provides the recommended safety information.

- Product identifier used on the label and any other names or synonyms by which the substance is known.
- Name, address, phone number of the manufacturer, distributor, or other responsible party, and emergency phone number.
- Recommended use of the chemical (e.g., a first aid kit, a cleaning agent, or a solvent).
- Any restrictions on use (e.g., do not use for food contact).



Section 2: Hazard(s) Identification

This section contains the hazards of the chemical on the SDS and the appropriate warning information associated with those hazards. The required information consists of:

- The hazard classification of the chemical (e.g., flammable liquid, category 2).
- Signal word.
- Hazard statement(s).
- Pictograms (the pictograms or hazard symbols may be presented as graphical reproductions of the symbols in black and white or as a description of the name of the symbol (e.g., skull and crossbones, flame).
- Precautionary statement(s).
- Description of any hazards not otherwise classified.
- For a mixture that contains an ingredient with unknown toxicity, a statement indicating that the hazard classification of the ingredient is unknown and that the mixture may be more hazardous than the individual ingredients.



Section 3: Ingredients Information

This section provides information on the ingredients of the chemical on the SDS, including impurities and stabilizing additives. This section includes information on substances, mixtures, and all chemicals where a trade secret is claimed. The required information consists of:

- Chemical name and synonyms.
- Chemical name and synonyms.
- Chemical Abstracts Service (CAS) number and other unique identifiers.
- Impurities and stabilizing additives, which are themselves classified and which contribute to the hazard classification of the chemical.
- Mixtures.

- Some information required for substances:
 - The chemical name and concentration (i.e., exact percentage) of all ingredients which are classified as health hazards and are present above their cut-off concentration limits.
 - There is a high risk that the cut-off concentration limits.
 - The concentration (exact percentage) of each ingredient must be specified except concentration ranges may be used in the following situations:
 - Trade secrets.
 - There is such a high variation, or
 - The SDS is used for a group of substantially similar mixtures.
 - Details where a trade secret is claimed.
 - A statement that the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret is required.



Section 4: First-Aid Measures

This section describes the most cases that should be given by personnel responding to an individual who has been exposed to the chemical. The required information consists of:

- Necessary first aid instructions by relevant routes of exposure (inhalation, skin and eye contact, and ingestion).
- Other signs or symptoms requiring symptoms or effects, and any symptoms that are acute or delayed.
- Recommendations for immediate medical care and special treatment needed, when necessary.

Section 5: Fire-Fighting Measures

This section provides recommendations for fighting a fire caused by the chemical. The required information consists of:

- Recommendations of suitable extinguishing equipment, and information about extinguishing equipment that is not appropriate for a particular situation.
- Advice on special hazards that may result from the chemical during the fire, such as any hazardous combustion products created when the chemical burns.
- Recommendations on special protective measures for firefighters.

Section 6: Accidental Release Measures

This section provides recommendations on the appropriate response to spills, leaks, or releases. The required information consists of:

- Use of personal precautions (such as removal of ignition sources or preventing further release) and protective equipment to prevent the release of the chemical, and clothing.
- Emergency procedures, including instructions for evacuation, consulting experts, and other actions.
- Methods and materials used for containment (e.g., covering the drums and capping openings).
- Cleaning procedures (e.g., appropriate techniques for decontamination, decontamination, cleaning or vacuuming, sufficient materials, and/or equipment required for containment).

Section 7: Handling and Storage

This section provides guidance on the safe handling practices and conditions for safe storage of chemicals. The required information consists of:

- Precautions for handling (e.g., use of personal protective equipment, use of engineering controls, minimizing the release of the chemical into the environment, and providing advice on general hygiene practices (e.g., eating, drinking, and smoking).
- Recommendations on the conditions for safe storage, including any incompatibilities.
- Provide advice on specific storage requirements (e.g., ventilation requirements).

Section 8: Exposure Controls/Personal Protection

This section contains the exposure controls and personal protection measures. The required information consists of:

- Control measures (e.g., engineering controls, administrative controls, and use of personal protective equipment).
- Exposure limits (e.g., OSHA's Permissible Exposure Limit (PEL), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet).
- Appropriate types of eye, face, skin or respiratory protection needed based on exposure to chemicals, such as personal protective equipment (PPE) or other appropriate types of eye, face, skin or respiratory protection needed based on exposure to chemicals.
- Any glove material, such as PVC or nitrile rubber gloves, and breakthrough time of the glove.



Section 9: Physical/Chemical Properties

This section identifies physical and chemical properties associated with the chemical. The required information consists of:

- Appearance (physical state, color, etc.).
- Upper/lower flammability or explosive limits.
- Boiling point.
- Vapor pressure.
- Density (relative to water).
- Specific gravity.
- pH.
- Relative density.
- Melting/freezing point.
- Stability (decomposition).
- Reactivity (e.g., with water, acids, bases, oxidizers, etc.).
- Flash point.
- Evaporation rate.
- Flammability (solid, gas).
- Flammable concentration (LFL).
- Auto-ignition temperature.
- Decomposition temperature.

The SDS may not contain every item on the above list because information may not be available or is not available. When this occurs, a notation to that effect must be made for each item on the list. The SDS may also contain other relevant information, such as the dust deflagration index (KSt) for combustible dust, used to evaluate a dust's explosion potential.



Notes:

Business Contacts:

Supplier/Manufacturer:

Customer:

Other:

Other:

Emergency Contacts:

Supplier:

Customer:

Other:

Other:

Section 10: Stability and Reactivity

This section describes the stability hazards of the chemical and the chemical stability information. This section is broken into three parts: reactivity, chemical stability, and other chemical stability.

- Reactivity: This section describes the reactivity of the chemical. This data is broken down by the chemical's reactivity, and data for the chemical's reactivity. This data is broken down by the chemical's reactivity, and data for the chemical's reactivity. This data is broken down by the chemical's reactivity, and data for the chemical's reactivity.
- Chemical stability: This section describes the chemical stability of the chemical. This data is broken down by the chemical's chemical stability, and data for the chemical's chemical stability. This data is broken down by the chemical's chemical stability, and data for the chemical's chemical stability.
- Other chemical stability: This section describes the other chemical stability of the chemical. This data is broken down by the chemical's other chemical stability, and data for the chemical's other chemical stability. This data is broken down by the chemical's other chemical stability, and data for the chemical's other chemical stability.

Section 11: Toxicological Information

This section describes the toxicological information and the information that is not available. The required information consists of:

- Routes of exposure (inhalation, ingestion, skin and eye contact). The SDS should indicate if the information is available.
- Acute effects: This section describes the acute effects of the chemical. This data is broken down by the chemical's acute effects, and data for the chemical's acute effects. This data is broken down by the chemical's acute effects, and data for the chemical's acute effects.
- Chronic effects: This section describes the chronic effects of the chemical. This data is broken down by the chemical's chronic effects, and data for the chemical's chronic effects. This data is broken down by the chemical's chronic effects, and data for the chemical's chronic effects.
- Reproductive effects: This section describes the reproductive effects of the chemical. This data is broken down by the chemical's reproductive effects, and data for the chemical's reproductive effects. This data is broken down by the chemical's reproductive effects, and data for the chemical's reproductive effects.
- Developmental effects: This section describes the developmental effects of the chemical. This data is broken down by the chemical's developmental effects, and data for the chemical's developmental effects. This data is broken down by the chemical's developmental effects, and data for the chemical's developmental effects.

Section 12: Ecological Information

This section provides information on the ecological effects of the chemical. The required information consists of:

- Ecotoxicity: This section describes the ecotoxicity of the chemical. This data is broken down by the chemical's ecotoxicity, and data for the chemical's ecotoxicity. This data is broken down by the chemical's ecotoxicity, and data for the chemical's ecotoxicity.
- Environmental fate: This section describes the environmental fate of the chemical. This data is broken down by the chemical's environmental fate, and data for the chemical's environmental fate. This data is broken down by the chemical's environmental fate, and data for the chemical's environmental fate.
- Biodegradability: This section describes the biodegradability of the chemical. This data is broken down by the chemical's biodegradability, and data for the chemical's biodegradability. This data is broken down by the chemical's biodegradability, and data for the chemical's biodegradability.
- Other: This section describes the other ecological information of the chemical. This data is broken down by the chemical's other ecological information, and data for the chemical's other ecological information. This data is broken down by the chemical's other ecological information, and data for the chemical's other ecological information.

Section 13: Disposal Considerations

This section provides guidance on the disposal of the chemical. The required information consists of:

- Disposal methods: This section describes the disposal methods of the chemical. This data is broken down by the chemical's disposal methods, and data for the chemical's disposal methods. This data is broken down by the chemical's disposal methods, and data for the chemical's disposal methods.
- Disposal of the physical and chemical properties that may affect disposal activities.
- Precautions for disposal (e.g., use of personal protective equipment, use of engineering controls, etc.).



Section 14: Transport Information

This section provides guidance on the transport of the chemical. The required information consists of:

- Transport hazard information: This section describes the transport hazard information of the chemical. This data is broken down by the chemical's transport hazard information, and data for the chemical's transport hazard information. This data is broken down by the chemical's transport hazard information, and data for the chemical's transport hazard information.
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Section 15: Regulatory Information

This section identifies the safety, health, and environmental regulations specific to the chemical. The required information consists of:

- Any material and/or regulatory information of the chemical or mixtures including any OSHA, EPA, or other regulatory information.
- Agency or Consumer Product Safety Commission regulations.

Section 16: Other Information

This section provides information on the other information of the chemical. The required information consists of:

- Other information: This section describes the other information of the chemical. This data is broken down by the chemical's other information, and data for the chemical's other information. This data is broken down by the chemical's other information, and data for the chemical's other information.
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Handbook of Hazard Communication and OSHA Requirements Lowry, 1985-07-01 Some 70 000 hazardous materials are in various workplaces across the country regulated by the OSHA Hazard Communication Standard not only for chemical manufacturers and distributors but soon for all other U S manufacturers and many others as well This guide provides a step by step understanding of the standard With this book you should be able to plan organize and operate your company's Hazard Communication Program to protect your employees and your company as required by OSHA This handbook is especially intended for use by industrial hygienists safety directors safety engineers occupational health departments managers environmental engineers legal staff and consultants Hazard Communication and OSHA Requirements explains carefully in non legalistic terms just what will be required and when But even more important it explains in detail with examples where appropriate To Assess Paperwork Requirements of OSHA's Hazard Communication Standard

United States. Congress. Senate. Committee on Small Business, 1989 Drug Information Bonnie Snow, 1999-11-17 Designed for use as a self study text as a course text in more formal instruction programs or as a refresher for the busy professional the book includes valuable background data on legal and regulatory issues as well as pharmaceutical technology

Handbook of Hazard Communication and OSHA Requirements Lowry, 2017-11-22 Some 70 000 hazardous materials are in various workplaces across the country regulated by the OSHA Hazard Communication Standard not only for chemical manufacturers and distributors but soon for all other U S manufacturers and many others as well This guide provides a step by step understanding of the standard With this book you should be able to plan organize and operate your company's Hazard Communication Program to protect your employees and your company as required by OSHA This handbook is especially intended for use by industrial hygienists safety directors safety engineers occupational health departments managers environmental engineers legal staff and consultants Hazard Communication and OSHA Requirements explains carefully in non legalistic terms just what will be required and when But even more important it explains in detail with examples where appropriate OSHA Standards for General Industry as of August 2007 CCH Incorporated, Debra

Levin, 2007-07 **Hazard Communication in the 21st Century Workforce** United States. Congress. Senate. Committee on Health, Education, Labor, and Pensions. Subcommittee on Employment, Safety, and Training, 2004 **OSHA Standards for the Construction Industry As of August 1, 2002** Toolkit Media Group, 2002 Provides the texts of OSHA construction industry standards *OSHA Standards for General Industry* CCH Incorporated, 2006-02 **Guidelines for Incorporating**

Safety and Health Into Engineering Curricula: Laboratory safety, 1994 A Guide for Protecting Workers from Woodworking Hazards, 1999 **Construction Safety Handbook** Mark McGuire Moran, 2003-07 This much anticipated new edition provides employers and employees with a day to day guide to reducing accidents and injuries ensuring compliance avoiding fines and penalties and controlling workers compensation costs You'll not only find comprehensive

discussions on all of the construction safety regulations found in the Code of Federal Regulations CFR Title 29 Part 1926 but you ll also find the actual legal text of the regulations and overviews for each subpart for easier reference This Construction Safety Handbook covers both the obvious and the hidden dangers of construction and addresses the latest changes in OSHA standards including new recordkeeping requirements new ergonomic guidelines new requirements in the Steel Erection standard and new additions to signs signals and barricades requirements Written in plain English this comprehensive handbook provides you with the legal background practical advice and ready to use written compliance programs you need to ensure your sites meet workplace safety requirements protect workers and comply with the standards Each chapter provides a description of the requirements of the standard and a sample written compliance program checklists and the appropriate citations from the 29 CFRs The latest changes in enforcement and inspection policy are also detailed and a list of OSHA s most frequently cited construction standards is given

Employment Safety and Health Guide ,2004 Includes original text of the Occupational safety and health act of 1970

Hazardous Substances Resource Guide Richard P. Pohanish,Stanley A. Greene,1997 This US resource guide provides concerned citizens with a on approximately 1500 chemical hazardous materials found in the home workplace and community including what they are there effects on human health the laws controlling their use proper handling and resources for more in depth study political action and networking

MSDS Reference for Crop Protection Products ,2007

2005 State by State Guide to Human Resources Law John F. Buckley,Professor for the Study of Ethics and Human Values Ronald M Green,2004-12-16 2005 State by State Guide to Human Resources Law is the most comprehensive authoritative guide To The employment laws of the 50 states And The District of Columbia it is designed to provide quick access to each state s laws on the expanding number of issues and concerns facing business executives and their advisorsrequest the professionals in Human Resources Compensation and Employee Benefits who work in multijurisdictional environments 2005 State by State Guide to Human Resources Law incorporates a large number of substantive changes and valuable additions To The existing material As follows The Trends and Controversies section features commentary on many recent development Part 1 includes many new cases to reflect recent judicial decisions defining the parameters of enforceable noncompetition clauses in employment contracts Part 2 contains updated tables on protected classifications under state fair employment a discussion of the applicability of Equal Employment Opportunity Commission EEOC guidelines to state fair employment practice enforcement a discussion of the latest judicial decisions that recognize the similarities and differences between federal and state statutes prohibiting discrimination in the workplace and discussion of recent cases and legislation from California Illinois Massachusetts Michigan North Carolina Ohio and Washington that recognize differences between federal and state employment laws Part 3 contains updated coverage of wage and hour laws including requirements for minimum wage overtime frequency of payment recordkeeping and employment of minors Discussion of the Illinois legislation rejecting federal changes to overtime

exemptions is also included Part 4 covers new developments in case law and provides information on recent legislation regarding how to avoid having employee handbooks construed as employment contracts Part 5 contains revised and updated information about state mandated employee benefits information about recent developments in laws regulating payments due upon termination death and severance from employment and new cases dealing with issues that have been the subject of recent litigation under both the Family and Medical Leave Act FMLA and individual state family and medical leave laws Part 7 has been expanded to cover important changes to state legislation governing testing for drugs Business executives and their professional advisors today face an increasingly complex web of law and regulation with regard To The human resources function Actions of both the federal And The state governments have placed increasing burdens and responsibilities on business relating To The treatment of applicants and employees And the courts both federal and state have also involved themselves in how employers may deal with applicants and employees importing legal concepts and doctrines of long standing into the domain of the employer employee relationship

"Code of Massachusetts regulations, 2013" ,2013 Archival snapshot of entire looseleaf Code of Massachusetts Regulations held by the Social Law Library of Massachusetts as of January 2020

"Code of Massachusetts regulations, 2011" ,2011 Archival snapshot of entire looseleaf Code of Massachusetts Regulations held by the Social Law Library of Massachusetts as of January 2020

"Code of Massachusetts regulations, 2016" ,2016 Archival snapshot of entire looseleaf Code of Massachusetts Regulations held by the Social Law Library of Massachusetts as of January 2020

"Code of Massachusetts regulations, 2015" ,2015 Archival snapshot of entire looseleaf Code of Massachusetts Regulations held by the Social Law Library of Massachusetts as of January 2020

"Code of Massachusetts regulations, 2012" ,2012 Archival snapshot of entire looseleaf Code of Massachusetts Regulations held by the Social Law Library of Massachusetts as of January 2020

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tb m_1 tc m_2 tc m_1 td m_2 td m_1 te m_2 te m_1 tf m_2 tf m_1 tg m_2 tg m_1 th m_2 th m_1 ti m_2 ti m_1 tj m_2 tj m_1 tk m_2 tk m_1 tl m_2 tl m_1 tm m_2 tm m_1 tn m_2 tn m_1 to m_2 to m_1 tp m_2 tp m_1 tq m_2 tq m_1 tr m_2 tr m_1 ts m_2 ts m_1 tt m_2 tt m_1 tu m_2 tu m_1 tv m_2 tv m_1 tw m_2 tw m_1 tx m_2 tx m_1 ty m_2 ty m_1 tz m_2 tz m_1 ua m_2 ua m_1 ub m_2 ub m_1 uc m_2 uc m_1 ud m_2 ud m_1 ue m_2 ue m_1 uf m_2 uf m_1 ug m_2 ug m_1 uh m_2 uh m_1 ui m_2 ui m_1 uj m_2 uj m_1 uk m_2 uk m_1 ul m_2 ul m_1 um m_2 um m_1 un m_2 un m_1 uo m_2 uo m_1 up m_2 up m_1 uq m_2 uq m_1 ur m_2 ur m_1 us m_2 us m_1 ut m_2 ut m_1 uu m_2 uu m_1 uv m_2 uv m_1 uw m_2 uw m_1 ux m_2 ux m_1 uy m_2 uy m_1 uz m_2 uz m_1 va m_2 va m_1 vb m_2 vb m_1 vc m_2 vc m_1 vd m_2 vd m_1 ve m_2 ve m_1 vf m_2 vf m_1 vg m_2 vg m_1 vh m_2 vh m_1 vi m_2 vi m_1 vj m_2 vj m_1 vk m_2 vk m_1 vl m_2 vl m_1 vm m_2 vm m_1 vn m_2 vn m_1 vo m_2 vo m_1 vp m_2 vp m_1 vq m_2 vq m_1 vr m_2 vr m_1 vs m_2 vs m_1 vt m_2 vt m_1 vu m_2 vu m_1 vv m_2 vv m_1 vw m_2 vw m_1 vx m_2 vx m_1 vy m_2 vy m_1 vz m_2 vz m_1 wa m_2 wa m_1 wb m_2 wb m_1 wc m_2 wc m_1 wd m_2 wd m_1 we m_2 we m_1 wf m_2 wf m_1 wg m_2 wg m_1 wh m_2 wh m_1 wi m_2 wi m_1 wj m_2 wj m_1 wk m_2 wk m_1 wl m_2 wl m_1 wm m_2 wm m_1 wn m_2 wn m_1 wo m_2 wo m_1 wp m_2 wp m_1 wq m_2 wq m_1 wr m_2 wr m_1 ws m_2 ws m_1 wt m_2 wt m_1 wu m_2 wu m_1 wv m_2 wv m_1 ww m_2 ww m_1 wx m_2 wx m_1 wy m_2 wy m_1 wz m_2 wz m_1 xa m_2 xa m_1 xb m_2 xb m_1 xc m_2 xc m_1 xd m_2 xd m_1 xe m_2 xe m_1 xf m_2 xf m_1 xg m_2 xg m_1 xh m_2 xh m_1 xi m_2 xi m_1 xj m_2 xj m_1 xk m_2 xk m_1 xl m_2 xl m_1 xm m_2 xm m_1 xn m_2 xn m_1 xo m_2 xo m_1 xp m_2 xp m_1 xq m_2 xq m_1 xr m_2 xr m_1 xs m_2 xs m_1 xt m_2 xt m_1 xu m_2 xu m_1 xv m_2 xv m_1 xw m_2 xw m_1 xx m_2 xx m_1 xy m_2 xy m_1 xz m_2 xz m_1 ya m_2 ya m_1 yb m_2 yb m_1 yc m_2 yc m_1 yd m_2 yd m_1 ye m_2 ye m_1 yf m_2 yf m_1 yg m_2 yg m_1 yh m_2 yh m_1 yi m_2 yi m_1 yj m_2 yj m_1 yk m_2 yk m_1 yl m_2 yl m_1 ym m_2 ym m_1 yn m_2 yn m_1 yo m_2 yo m_1 yp m_2 yp m_1 yq m_2 yq m_1 yr m_2 yr m_1 ys m_2 ys m_1 yt m_2 yt m_1 yu m_2 yu m_1 yv m_2 yv m_1 yw m_2 yw m_1 yx m_2 yx m_1 yz m_2 yz m_1 za m_2 za m_1 zb m_2 zb m_1 zc m_2 zc m_1 zd m_2 zd m_1 ze m_2 ze m_1 zf m_2 zf m_1 zg m_2 zg m_1 zh m_2 zh m_1 zi m_2 zi m_1 zj m_2 zj m_1 zk m_2 zk m_1 zl m_2 zl m_1 zm m_2 zm m_1 zn m_2 zn m_1 zo m_2 zo m_1 zp m_2 zp m_1 zq m_2 zq m_1 zr m_2 zr m_1 zs m_2 zs m_1 zt m_2 zt m_1 zu m_2 zu m_1 zv m_2 zv m_1 zw m_2 zw m_1 zx m_2 zx m_1 zy m_2 zy m_1 zz m_2 zz m_1 aa m_2 aa m_1 ab m_2 ab m_1 ac m_2 ac m_1 ad m_2 ad m_1 ae m_2 ae m_1 af m_2 af $m_1</$

bent with zero initial moment along other axis 8 braced and unbraced columns 10