# Safety Data Sheets Stats and Facts

## DID YOU KNOW?

### Safety Data Sheets (SDS)

A safety data sheet, or SDS, is a standardized document that contains occupational safety and health data. The International Hazard Communication Standard (HCS) mandates that chemical manufacturers must communicate a chemical's hazard information to chemical handlers by providing a Safety Data Sheet. SDS's typically contain chemical properties, health and environmental hazards, protective measures, as well as safety precautions for storing, handling, and transporting chemicals.

### Globally Harmonized System

GHS is a set of international guidelines that were developed by the United Nations. These guidelines were created to ensure the safe manufacturing, handling, use, disposal, and transport of hazardous materials. The GHS system is used to:

- Classify chemical data and hazard criteria.
- Identify a chemical's health, physical, and environmental hazards.
- Provide chemical manufacturers and distributors with a well-defined system to communicate a chemical's hazard information and protective measures.

### SDS Structure and Format

Safety data sheets have sixteen sections. The early sections, one through eight, focus on quick access to essential information that might be required by chemical handlers for safe handling practices or by emergency response personnel. Sections nine through eleven contain technical and scientific data, e.g., stability,

reactivity, physical & chemical properties. Sections twelve through fifteen are not mandatory; however, they are required to be fully GHS compliant. The last section, section sixteen, contains information about the SDS itself, e.g., the revision date and changes since the last version.

## SDS Information for Employers

Employers must ensure that employees have access to safety data sheets for all of the hazardous chemicals they handle. Employers may fulfill this requirement in a variety of ways. For example, SDS binders are quite common as are computer-based SDS databases. What's important is that employees have access to the safety data sheets for all of the chemicals that they are using. If the employer does not have an SDS for one of these chemicals they should contact the manufacturer to obtain the current version of the SDS for that chemical. In this sense, the online SDS databases have a clear advantage over binder-based systems since the database vendor usually takes care of indexing and updating the safety data sheets.

## Reality Alert

A YMCA employee was hospitalized after inhaling a volatile mixture of two common pool chemicals. The poisonous chlorine gas vapors quickly spread through the Y, endangering more than 100 members, mainly children. A prompt response from the local fire department and a hazardous materials team is the only reason injuries were not more serious. According to the Center for Disease Control, the employee's failure to follow the chemical guidelines could have resulted in dozens of fatalities. In addition to symptoms such as vomiting and skin blisters, chlorine gas can cause a fluid buildup in the lungs called pulmonary edema which can be fatal. The executive director stated the employees were familiar with the chemicals and attributed the incident as a failure to interpret the chemical's safety information.

# Chemical Exposure Statistics

The Occupational Safety & Health Administration (OSHA) estimates that exposures to chemicals used for large-scale cleaning account for approximately 860,000 occupational illnesses and 60,000 deaths every year. Pool maintenance-related injuries account for more than 5,000 emergency room visits annually, according to the CDC. These statistics highlight the potential dangers chemicals pose, and why it’s crucial to provide protection for their employees and patrons.

The chemical industry is one of the largest and most important industries worldwide. The United States is one of the largest national producers of chemical products globally. Including the pharmaceutical sector, its chemical shipments value was more than 797 billion U.S. dollars in 2019. The value added by U.S. chemistry in 2018 amounted to over 378 billion U.S. dollars.

Chemical companies from the United States are among the industry’s leading global players. With a revenue of 42.9 billion U.S. dollars in 2019, Dow is the largest U.S. chemical company, and the world’s second largest behind German chemical company BASF. Other leading U.S. chemical companies are LyondellBasell, and DuPont.

In 2016, several of the leading global chemical companies announced mergers, effectively changing the dynamics of the global chemical industry. One of the most famous mergers that happened at that time was the Dow Chemical and DuPont merger, which was cleared by European regulators in March 2017. Following the finalization of the merger in September 2017, the new conglomerate DowDuPont existed as a single entity until April 2019, when it separated into three companies: Dow, DuPont, and agricultural chemistry company Corteva.

With the exception of Germany, the U.S. is the world’s largest exporter of chemical goods. In 2019, U.S. chemical exports were worth some 196.5 billion U.S. dollars. The leading countries of destination for U.S. chemical exports were Canada, Mexico, and China. However, U.S. demand for chemical imports is also large. In 2019, these imports were worth around 102 billion U.S. dollars.

Corresponding with its dimension, the chemical industry is an important employer. Approximately 544,000 people work at U.S. chemical companies, including the pharmaceutical sector. This number is distinctly lower than in the late 1990s, when almost one million employees were reported. In 2019, an average U.S. chemical production worker had a working week of 42.3 hours, and in 2019 had an hourly wage of 25.40 U.S. dollars.

The U.S. chemical industry spends relevant amounts for research and development. In 2019, more than ten billion U.S. dollars were spent for R&D purposes in the chemical industry. That means that R&D funds have almost doubled over the last decade. Accordingly, the United States is the global leader in developing new chemical and pharmaceutical entities.

## What do Safety Data Sheets Contain?

OSHA has issued an update to the old Material Safety Data Sheets (MSDS) requirements. The new requirements for Safety Data Sheets include 16 specific sections that, according to OSHA, are "ensuring consistency in presentation of important protection information." However, they are still similar to the old Material Safety Data Sheets in that they still contain information about the properties of a particular substance. They should be available for all chemicals and substances and they're designed to provide workers and emergency personnel with proper procedures for handling a specific substance. The new update requires SDS to be in a **uniform format** and include this information (from OSHA's SDS Quick Card and Appendix D):

- **Section 1, Identification:** includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.
- **Section 2, Hazard(s) identification:** includes all hazards regarding the chemical; required label elements.
- **Section 3, Composition/information on ingredients:** includes information on chemical ingredients; trade secret claims.
- **Section 4, First-aid measures:** includes important

symptoms/effects, acute, delayed; required treatment.

- **Section 5, Fire-fighting measures:** lists suitable extinguishing techniques, equipment; chemical hazards from fire.
- **Section 6, Accidental release measures:** lists emergency procedures; protective equipment; proper methods of containment and cleanup.
- **Section 7, Handling and storage:** lists precautions for safe handling and storage, including incompatibilities.
- **Section 8, Exposure controls/personal protection:** lists OSHA's Permissible Exposure Limits (PELs); ACGIH Threshold Limit Values (TLVs); and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the SDS where available, as well as appropriate engineering controls; personal protective equipment (PPE).
- **Section 9, Physical and chemical properties:** lists the chemical's characteristics.
- **Section 10, Stability and reactivity:** lists chemical stability and possibility of hazardous reactions.
- **Section 11, Toxicological information:** includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.
- **Section 12, Ecological information:** includes information on Eco toxicity and other adverse environmental effects.
- **Section 13, Disposal considerations:** a description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging.
- **Section 14, Transport information:** includes special precautions, which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside the premises.
- **Section 15, Regulatory information:** safety, health and environmental regulations specific for the product in question.
- **Section 16, Other information:** includes the date of preparation or last revision.

## Properly Displaying Safety Data Sheets

The requirements for displaying SDS have stayed the same with the new update from OSHA. The main requirement for SDS is that they're maintained on site, are readily accessible, and are available for every product used in the facility, including products brought from home. It's important all employees not only know where every SDS is kept, but **have access to them at all times** without barriers. This means they should not be stored on a password protected computer, locked inside a room or file cabinet, or stored in hard-to-find places. Employees should not have to ask a supervisor for a SDS. Large facilities with multiple sites must maintain complete and up-to-date SDS at every location. SDS may be maintained electronically, but this method must be barrier free, without any password protection or log-in barriers. Electronically-stored SDS must be backed up by a hard copy in case of a power outage or computer malfunction. There are no specific guidelines for organizing SDS outlined by OSHA; typically, they're organized in a three-ring binder or some other type of folder.