
Starting June 1, 2015, under 29 CFR 1910.1200 GHS Hazard Communication, each initial shipment of hazardous chemicals from suppliers, distributors, manufacturers or importers, must include a new Safety Data Sheet (SDS) and labels on the containers to inform downstream users about the hazards of these chemicals. By providing in-depth hazard communication information, downstream employers can develop procedures to protect employees from exposure during the following situations:

1. Routine workplace activities
2. In the event of a potential or actual hazardous chemical release

What does that mean? Like the Department of Transportation started doing years ago, OSHA will now align with international recommendations so that hazardous chemicals would be marked and labeled with the same information worldwide in the workplace, as well as in transportation. For example, a Hazard Class 8 Corrosive under DOT in transportation exhibits the same characteristics as the Hazard Class Corrosive Liquid under OSHA for in-plant worker protection. Toxic chemicals under OSHA would have the same test criteria and same definition as a Division 6.1 Toxic under DOT.

There are three Hazard Communication Components to the New GHS 1910.1200 Hazard Communication Regulations:

1) Hazard Communication Labels for containers. (required June 1, 2015) (see Rob’s January 2013 Blog)
2) Written Safety Data Sheets for each Hazardous Chemical. (required June 1, 2015)

Since I covered the hazard communication label component in my January blog, I would now like to discuss the the SDS or Safety Data Sheets and Appendix D of 1910.1200. The term “SDS” replaces the old terminology “(MSDS) material safety data sheet.” The SDS is the written document that must be prepared by the responsible party, the manufacturer, distributor or importer. The individual assigned this duty will be referred to as the “Classifier” in the regulations. The SDS must be sent to downstream users prior to, or with, the initial shipment of the hazardous chemical. If the SDS is not included with the first shipment, the downstream user receiving the material must request an SDS from the manufacturer, distributor or importer.

If the company has an appropriate written Hazard Communication Program, the SDS request will be done via a written request, of which a copy would be kept on file as documentation of the SDS request.

In cases such as this, it would be prudent of the user to not distribute the material until the SDS is received. When the SDS is received, the user can now determine whether or not additional employee training is required. Additional training may be necessary if, upon SDS review, it is discovered that the material exhibits a hazard or presents information for which employees have not received training.
Those of you who have past experience with the Hazard Communication Standard know that there was never any OSHA required format for the old MSDSs. Some of you may also be aware that, although not a regulatory requirement, there are harmonized data sheets. This is the result that is consistent with the order of information included in a voluntary industry consensus standard for Safety Data Sheets (ANSI Z400.1).

It is also important to know that each section of the SDS is designed to provide specific information to specific workers (Facility Personnel, Plant Workers, Safety and Security Employees, etc.) and various levels of emergency responders (ie: First Responder Awareness Level, Hazardous Material Specialist, etc.) and Healthcare Workers. So, not all the information on the SDS will apply to all of your workers and this could be conveyed during training to workers and emergency responders under existing 29 CFR OSHA 1910.38(a), the Emergency Action Plan, and 1910.120(q) Emergency Response HAZWOPER requirements.

Having researched the domestic regulations and international recommendations of the Hazard Communication Global Harmonization Standards, the most logical way to meet and understand these difficult and confusing regulations is by breaking your employees down using existing OSHA training requirements that your company has already met, the 1910.38(a) Emergency Action Plan for the facility and the five training levels under 1910.120(q) HAZWOPER Hazardous Substance Emergency Response regulations with an additional category covering health care professionals.

**1910.38(a) THE EMERGENCY ACTION PLAN**

The Emergency Action Plan, when required, is an evacuation plan to protect workers in the event of any emergency. Whether fire, explosion, flood, tornado or earthquake, your workforce must know and understand their responsibilities in an emergency. It must be in writing and cover alarms, evacuation and exits. The plan would include personnel that would remain behind for critical plant operations, rescue and medical duties. All of the following levels must be trained on the company’s 1910.38(a) Emergency Action Plan.

**1) FIRST RESPONDER AWARENESS LEVEL**

Any employee who is to likely witness or discover a hazardous substance release when carrying out their job functions under 1910.120(q)(6)(i). These employees must be trained to initiate the 1910.38(a) Emergency Action Plan, take no further action and then evacuate the facility unless they have been trained to one of the higher training levels. This could mean any or all of your employees.

**2) FIRST RESPONDER OPERATIONS LEVEL**

Any individual who responds to the initial or potential release of a hazardous substance without actually responding to the release or potential release for the purpose of stopping the release 1910.120(q)(6)(ii) and allows them to respond in a defensive manner without actually trying to stop the release. First responders at the operations level should have received at least 8 hours of training on specific competencies in addition to those listed for the First Responder Awareness level.

**3) HAZARDOUS MATERIALS TECHNICIAN LEVEL**

Any individual who responds to the release or potential release for the purpose of stopping the release. They will approach the point of release in order to plug, patch or otherwise stop the release. Hazardous Materials Technicians should have received at least 24 hours of training equal to the First Responder Operations Level in addition to the competencies listed in 1910.120(q)(6)(iii).

**4) HAZARDOUS MATERIALS SPECIALIST LEVEL**

The specialist duties parallel those of the hazmat technician; however, those duties may require more directed or specific knowledge of various substances they may be called on to contain. They also act as liaisons with local, state, and federal government agencies. Hazardous Materials Specialist Level should have received 24 hours initial training equal to the technician level in addition to the competencies listed under 1910.120(q)(6)(iv).
5) ON SCENE INCIDENT COMMANDER
Anyone who would assume control of an incident scene beyond the First Responder Awareness Level. On scene commanders should have received at least 24 hours of training equal to the First Responder Operations Level in addition to the competencies listed in 1910.120(q)(6)(v).

6) HEALTH CARE PROFESSIONALS
These individuals may or may not be your employees, but would be contacted before, during or after occupational or emergency response operations or exposure to a hazardous chemical for advice, consultation or treatment.

On the SDS, there are 16 INFORMATION SECTIONS, 12 of which are mandatory (Sections 1 through 11 and 16) and 4 non-mandatory (Sections 12 through 15). The following list presents the required Safety Data Sheet format and the title of each Information Section.

- Section 1 Identification
- Section 2 Hazard(s) Identification
- Section 3 Composition / Information on Ingredients
- Section 4 First-aid measures
- Section 5 Fire-fighting measures
- Section 6 Accidental release measures
- Section 7 Handling and storage
- Section 8 Exposure controls / Personal protection
- Section 9 Physical and chemical properties
- Section 10 Stability and reactivity
- Section 11 Toxicology information
- Section 12 Ecological information (non-mandatory)
- Section 13 Disposal considerations (non-mandatory)
- Section 14 Transport information (non-mandatory)
- Section 15 Regulatory information (non-mandatory)

Section 16 Other information including date of preparation of last revision.

Now I will present examples of the kinds of specific information that should be listed on an SDS and how it may appear on the document. I will be using the chemical ACETONE for the examples. The information in each section must comply with Appendix D of 1910.1200 - Safety Data Sheets, and is referred to as the “minimum information for an SDS, Heading and Subheading.” The product identifier at a minimum will contain the chemical name and should also present the synonyms.

SECTION 1 - IDENTIFICATION
Under Section 1 - Identification, there are 5 Hazard Identification Information components that will allow employees to ensure that they have the correct SDS for their Hazardous Chemical.

Levels 1 through 6; From First Responders Awareness through Healthcare Professionals should be trained to understand Section 1, Identification.
ACETONE
SDS
SECTION 1
IDENTIFICATION
a) Acetone
b) 2-Propanone, dimethyl ketone, ketone propane
c) Chemical parts cleaning, laboratory reagent, cleaning solvent
d) ABC Chemical Co.
   243 W Main Street
   Oley Pa 19530
   Office Telephone 555-555-5556
   email: abcchemical@cmail.com
   Emergency Telephone; 555-555-5555
   24-hr/day and 7 days/week

SECTION 2 - HAZARD(S) IDENTIFICATION
Section 2 on the SDS, Hazard(s) Identification, requires the responsible party to identify any health or physical hazards associated with the hazardous chemical. Responsible parties are required to use “all information available” to ensure that hazardous chemicals are classified properly. There is no requirement for testing chemicals. If the Responsible Party determines that the required information is not available or is not relevant to the chemical, then that must appear under the appropriate section.

Levels 1 through 6; First Responder Awareness through Healthcare Professionals should be trained and understand Section 2, Hazards Identification.

a) Classification of the Hazardous Chemicals under 29 CFR 1910.1200 Appendix A for Health Hazards and Appendix B for Physical Hazards. The following information presents the OSHA Appendices A and B classification criteria.

1910.1200APPENDIX A HEALTH HAZARD CRITERIA
In APPENDIX A, the hazard classifications are based on hazards to workers’ health, whether short- or long-term, from exposure in the workplace. This could be from either one single exposure to a hazardous chemical, like a poison or skin corrosive, or repeated exposure, where workers could be exposed over their entire career. (For example, a Carcinogenic.)
A.1 Acute Toxicity; Category 1 (most hazardous), 2, 3 and 4 (least hazardous)
LD 50 /LC 50 using single dose, multiple doses within 24 hours and inhalation exposure of 4 hours.
(DOT Division 6.1 Toxic or Poison, 49 CFR 173.132)
A.2 Skin Corrosion/Irritation; Category 1A, 1B, 1C and 2;
Full thickness skin destruction / reversible damage in under 4 hours.
(DOT 49 CFR 173.136 Class 8 Corrosive)
A.3 Serious Eye Damage / Irritation; Category 1, 2A, and 2B
Production of tissue damage or serious physical decay of vision
(No 49 CFR DOT definition)

A.4 Respiratory or Skin Sensitization; Category 1A and 1B
Hypersensitivity of airways or allergic reaction if inhaled.
(No 49 CFR DOT definition)

A.5 Germ cell mutagenicity; Category 1A, 1B, and 2
Permanent change in the amount or structure of genetic material in a cell
Example: Rodent dominant lethal mutation test OECD 478.
(No 49 CFR DOT definition)

A.6 Carcinogenicity; Category 1A, 1B, and 2
Substances which induce or increase the incidences of cancer
Using the International Agency for Research on Cancer, National Toxicology Program “Report on Carcinogenicity” and 1910.1000 Subpart Z
(No 49 CFR DOT definition)

A.7 Reproductive Toxicity; Category 1A, 1B, 2
Adverse effects on sexual function and fertility in adult males and females as well as adverse effects on the development of offspring. Animal and experimental data in 1910.1200 A.7.2
(No 49 CFR DOT definition)

A.8 Specific Target Organ Toxicity, Single Exposure; Category 1, 2, 3,
Specific non-lethal target organ toxicity arising from a single exposure to a chemical in 1910.1200 A.8.2
(No 49 CFR DOT definition)

A.9 Specific Target Organ Toxicity, Repeated or Prolonged Exposure; Category 1, 2
Specific target organ toxicity arising from repeated exposures reversible, non reversible, immediate and delayed in 1910.1200 A.9.2
(No 49 CFR DOT definition)

A.10 Aspiration Hazard; Category 1
Entry of a liquid or solid chemical directly through the oral or nasal cavity or indirectly from vomiting into the trachea or lower respiratory system in 29 CFR 1910.1200 A.10.2 Criteria for Aspiration Toxicity.
(No 49 CFR DOT definition)

1910.200 APPENDIX B PHYSICAL HAZARD CRITERIA
Appendix B Physical Hazard Classes cover Explosives, Flammables, Oxidizers and Corrosion on steel. These chemicals pose health risks based on immediate hazards to workers in their work areas and while working with chemicals. Physical hazards can happen quickly without warning and pose unique employee protection measures. Many of these Physical Hazards definitions in Appendix B are closely aligned with, if not the same as, the DOT Hazardous Material Transportation Classes and Definitions in 49 CFR 173.2.

B.1 Explosives Divisions 1.1 to 1.6
A solid or liquid is in itself capable by chemical reaction of producing gas at such a pressure and temperature and at such a speed to cause damage to the surroundings in 1910.1200 B.1.2
(DOT 49 CFR 173.50 Divisions 1.1 to 1.6 Explosives)
B.2 Flammable Gases Category 1 and 2
A gas having a flammable range with air at 20 degrees C and a standard pressure of 101.3 Kpa
(DOT 49 CFR 173.115 Class 2 Gases)

B.3 Flammable Aerosols Category 1 and 2
A non refillable receptacle containing a gas compressed liquefied or dissolved under pressure and fit-
ted with a relief allowing the contents to be ejected as particles in suspension in a gas or as a foam,
paste, powder, liquid or gas
(DOT 49 CFR 172.101 Table Column 2 Aerosols, 173.115 and 173.306)

B.4 Oxidizing Gases Category 1
A gas which may generally, by providing oxygen, cause or contribute to the combustion of other mate-
rials more than air does.
(DOT 49 CFR 173.115(b), Division 2.2 Gases)

B.5 Gases Under Pressure 4 Groups-Compressed Gas, Liquefied Gas, Refrigerated Liquefied Gas, and
Dissolved Gas
Gases which are contained in a receptacle at a pressure of 200 kpa or more or which are liquefied or
liquefied and refrigerated
(DOT 49 CFR 173.115 Class 2 Gases)

B.6 Flammable Liquids Category 1, 2, 3, 4
A liquid having a flashpoint if not more than 200 degrees Fahrenheit
(DOT 49 CFR 173.120 Class 3 Flammable Liquids)

If one were to look in the DOT Hazardous Materials Regulations under 173.120 for Hazard Class 3, Flammable
Liquids and Combustible Liquids, the definition uses below 140 degrees for Flammable Liquids and 141 to
200 degrees (199.9) as the cutoff for Combustible Liquids, so the definitions under DOT and OSHA are now
aligned, as with most of the OSHA and DOT Physical Hazard definitions.

B.7 Flammable Solids Category 1 and 2
A readily combustible solid or which may cause or contribute to fire through friction.
(DOT 49 CFR 173.124 Division 4.1 Flammable Solid)

B.8 Self-Reactive Chemicals Types A-G
Thermally unstable liquid or solid chemicals likely to want to go a strong exothermic decomposition
even without the participation of oxygen.
(DOT 49 CFR 173.124(a)(2) Division 4.1 Flammable Solid)

B.9 Pyrophoric Liquid Category 1
A liquid which even in small quantities is liable to ignite within 5 minutes after coming in contact with
air.
(DOT 49 CFR 173.124(b)(1) Division 4.2 Spontaneously Combustible)

B.10 Pyrophoric Solids Category 1
A solid which even in small quantities is liable to ignite within 5 minutes after coming in contact with
air.
(DOT 49 CFR 173.124(b)(1) Division 4.2 Spontaneously Combustible)
B.11 Self-Heating Chemicals Category 1 and 2
A liquid or solid chemical other than a pyrophoric liquid or solid which by reaction with air and without energy supply is liable to self heat. This chemical differs from a pyrophoric liquid or solid in that it will ignite only when in large quantities and after long periods of time.
(DOT 49 CFR 173.124(b)(2) Division 4.2 Spontaneously Combustible)

B.12 Chemical which in contact with Water, Emit Flammable Gases Category 1, 2, 3
Which in contact with water emit flammable gases are solid or liquid chemicals which by interaction with water are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.
(DOT 49 CFR 173.124(c) Division 4.3 Dangerous When Wet)

B.13 Oxidizing Liquid Category 1, 2, 3
A liquid which while in itself is not necessarily combustible may generally by yielding oxygen, cause or contribute to the combustion of other materials.
(DOT 49 CFR 173.127 Division 5.1 Oxidizers)

B.14 Oxidizing Solids Category 1, 2, 3
A solid which while in itself is not necessarily combustible may generally by yeilding oxygen cause or contribute to the combustion of other materials.
(DOT 49 CFR 173.127 Division 5.1 Oxidizers)

B.15 Organic Peroxides Types A-G
A liquid or solid organic chemical which may undergo exothermic self-accelerating decomposition. They are liable to explosive decomposition, burn rapidly, sensitive to impact or fiction and react dangerously with other substances.
(DOT 49 CFR 173.128 Division 5.2 Organic peroxides)

B.16 Corrosive to Metals
A chemical which by chemical action will materially damage or even destroy metal.
(DOT 49 CFR 173.136 Class 8 Corrosive (severe corrosion rate on steel))

a) Under 1910.1200, using the Appendices A and B, ACETONE meets three Hazard Classifications; however, when transported, ACETONE is only a Flammable Liquid, Hazard Class 3, Packing Group II under DOT.

The OSHA GHS Hazards Identification for Acetone would be:
1) Hazard Class Flammable Liquid in Category 2;
2) Eye Irritation in Category 2A; and
3) Specific Target Organ Toxicity - Single Exposure in Category 3
b) Once the chemical is classified, Appendix C provides the mandatory information that must appear on the SDS as part of the identification.
ACETONE
SDS
SECTION 2
DANGER

HAZARD(S) IDENTIFICATION
FLAMMABLE LIQUID CATEGORY 2
EYE IRRITATION CATEGORY 2A
SPECIFIC TARGET ORGAN TOXICITY SINGLE EXPOSURE CATEGORY 3
HIGHLY FLAMMABLE LIQUID AND VAPOR
CAUSES SERIOUS EYE IRRITATION
MAY CAUSE DROWSINESS OR DIZZINESS

i) Prevention
No Smoking.
Keep away from heat, sparks, open flame and hot surface.
Ground/bond container and receiving equipment.
Use explosion proof equipment.
Use non sparking tools.
Take precautionary measures against static discharge.
Wash any exposed skin thoroughly after handling.
Avoid breathing vapors or mist.
Use only outdoors or in a well ventilated area.
Wear protective gloves, eye protection, face protection.

ii) Response
Use dry chemical or CO2 to extinguished.
If inhaled: remove person to fresh air and keep comfortable for breathing.
If on skin or hair take off immediately all contaminated clothing. Rinse skin with water or shower.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists or if you feel unwell call Poison Center, Doctor or get medical attention

iii) Storage
Store in a cool well ventilated place
Keep container tightly closed

iv) Disposal

* Other hazards: Not available
** Acute toxicity: Not available

* Any Identified Hazards not already Classified (For example, dust, explosions, suffocation, or environmental effects) If none are identified, indicate “NOT AVAILABLE”
** Where an ingredient with unknown acute toxicity is used in a mixture at a concentration greater than or equal to 1% and the mixture is not classified based on testing of the mixture as a whole, a statement that X% of the mixture consists of ingredient(s) of unknown acute toxicity is required. If this does not apply, indicate “NOT AVAILABLE”
### SECTION 3 - COMPOSITION / INFORMATION ON INGREDIENTS

Provides the Chemical, Common Names and Synonyms; CAS numbers and other unique identifiers; impurities and stabilizers which are classified and contribute to the classification of the substance. Mixtures are then broken down by the chemical name and concentration of all ingredients that are classified as health hazards and are present above their cut-off/concentration limits or present a health risk below these limits. If a trade secret is being claimed, a statement must be included stating this.

Levels 2-6; First Responder Operations through Healthcare Professionals should be trained and understand Section 3 Composition/Information on Ingredients.

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| *SDS*

**SECTION 3**

**COMPOSITION / INFORMATION ON INGREDIENTS**

Except as provided for in paragraph (i) of 1910.1200 on trade secrets:

For Substances:

**ACETONE**

(2-PROPANONE, DIMETHYL KETONE, KETONE PROPANE)

CHEMICAL FORMULA C₃H₆O

CAS # 67-64-1

Impurities and stabilizing additives which are themselves classified and which contribute to the classification of the substance:

NOT AVAILABLE

*FOR MIXTURES

In addition to the information required for substances:

The chemical name and concentration (exact percentage) or concentration ranges of all ingredients which are classified as health hazards in accordance with paragraph (d) of 1910.1200 and are present above their cut-off/concentration limits; or present a health risk below their cut-off limits.

### SECTION 4 - FIRST AID MEASURES

Describes initial care that can be provided by untrained responders without medication or sophisticated equipment. Information on effects and routes of exposure and immediate treatment may also be provided to those first on the scene of a hazardous chemical exposure.

Level 1-6; First Responder Awareness through Healthcare Professionals should be trained and understand Section 4 First Aid Measures.
ACETONE
SDS
SECTION 4
FIRST AID MEASURES

a) First aid Measures
   General Advice:
   Move from dangerous area, consult physician, provide SDS to attending medical personnel
   If inhaled:
   Move person to fresh air, give artificial respiration if not breathing and consult physician.
   In case of contact with skin:
   Apply plenty of water and wash with soap. Remove contaminated clothing. Consult a physician.
   In case of eye contact:
   Thoroughly and cautiously rinse with water for at least 15 minutes. Consult an ophthalmologist.
   If swallowed:

b) Symptoms
   Symptoms include cough, headache, eye and throat irritation, dizziness, dermatitis at levels
   below 100 ppm and at higher levels may cause unconsciousness

c) Treatment
   Acetone has minimal toxicity on organ systems. Treatment of severe intoxication (narcosis) from
   exposure through ingestion or vapors is primarily supportive. If ingestion is recent removal by
   gastric lavage or activated charcoal may be prescribed.

SECTION 5 - FIRE-FIGHTING MEASURES

Lists the suitable and unsuitable extinguishing media; specific hazards that arise from the chemical before
and after combustion; and protective equipment and precautions for fire-fighters.

Levels 2-5; First Responder Operations through On-Scene Commanders should be
trained and understand Section 5 Fire-Fighting Measures.

ACETONE
SDS
SECTION 5
FIRE-FIGHTING MEASURES

a) Extinguishing Media:
   Dry chemical, Carbon Dioxide, Foam or Alcohol Type Foam. Do not apply water!

b) Specific Hazards:
   Extremely Flammable Liquid and Emits Extremely Flammable and Explosive Vapors when mixed
   with ambient air. Vapors heavier than air and may travel along floor. May ignite when exposed to
   Sparks, Heat, Flame or Oxidants.

c) Special Protective Equipment and Precautions for fire-fighters:
   Personal Protective Equipment. PPE Level C recommended. Self-Contained Breathing
   Apparatus. Keep fire-exposed containers cool using water spray. Remove containers from fire
   area if can be done without risk.
SECTION 6 - ACCIDENTAL RELEASE MEASURES
Outlines personal precautions, protective equipment and emergency procedures to minimize adverse effects on persons, property and the environment during accidental releases of the material; and methods and materials for containment and cleanup.
Levels 2-5; First Responder Operations through On-Scene Commander personnel should be trained and understand Section 6 Accidental Release Measures.

ACETONE
SDS
SECTION 6
ACCIDENTAL RELEASE MEASURES

a) Personal Precautions, Protective Equipment and Emergency Procedures:
   Avoid breathing Vapors gases or mists.  Use proper Personal Protection Equipment. Ensure proper ventilation of fumes and vapors if can be done safely. Remove all sources of ignition. Vapors may travel considerable distance to low lying ignition sources. Evacuate to safe area.

b) Methods and Material for Containment and Cleanup:
   Contain large spills using dike or berm. Take up spilled material with inert absorbent material like earth, sand or vermiculite. Use non-sparking tools and equipment and avoid ignition sources. Do not let enter drains or waterways. Clean up small spills using paper towels, water and detergent and allow to evaporate in Fume Hood or Cupboard. Place in non-plastic containers for transportation and disposal according to State, National and International Waste regulations.

SECTION 7 - HANDLING AND STORAGE
Provides employees with safe handling techniques to minimize the potential for hazards to workers and the proper storage when the chemical is not in use. This Section also includes any incompatibilities with the material.
Levels 1-5; First Responder Awareness through On-Scene Commander personnel should be trained and understand Section 7 Handling and Storage.

ACETONE
SDS
SECTION 7
HANDLING AND STORAGE

a) Precautions for Safe Handling:
   Avoid contact with skin and eyes.  Do not inhale vapors or mists.  Use in well ventilated areas.
   Do not use contact lenses.  Explosion and flameproof engineering controls should be in place.
   Use non-sparking tools and equipment when necessary.  Use techniques to eliminate accumulation of static charge when transferring material.

b) Conditions for Safe Storage including incompatibilities:
   No smoking. Store in cool dry and well ventilated area.  Avoid direct sunlight.  Store in securely closed original containers in an area designed for storage of Flammable Liquids under OSHA 29 CFR 1910.106.  Empty containers may still contain residue and/or vapors and OSHA Hazard Communication Labels may be still required. Store at 59 degrees F to 77 degrees F (15 degrees C to 25 degrees).  Avoid incompatible materials including Acid, Bases, Oxidizers, Nitrogen Fluoride Compounds, Sulfates, Perchlorates, Reducing Agents and Plastics.
SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Describes recommended Exposure Limit and Threshold Limit Value used to minimize worker and environmental exposure; engineering control measures and individual protection measures, including personal protection equipment.

Levels 2 - 6; First Responder Operations through Healthcare Professionals should be trained and understand Section 8 Exposure Controls/ Personal Protection.

ACETONE
SDS
SECTION 8
EXPOSURE CONTROLS/PERSONAL PROTECTION

a) OSHA Permissible Exposure Limits 1910.1000
Table Z-1 Limits for Air Contaminants
TWA 1000 ppm (2400 mg/m3)
ACGIH
TLV 500 ppm
8-hr exposure limit
750 ppm 15 min STEL
NIOSH
IDLH 2500 ppm
REL 250 PPM 10 hr/ 40 hr week
TWA 250 PPM (590 mg/m3)

b) Appropriate Engineering Controls:
Contents may be under pressure, caution when opening containers. Keep containers closed and in an upright position when not in use. Good ventilation required. Explosion-proof exhaust ventilation should be used (10 air changes per hour should be used). Use process enclosures, exhaust ventilation or other controls to maintain airborne levels below recommended exposure levels.

c) Individual Protection Measures:
Wear butyl-rubber, nitrile or super nitrile gloves. Use eye protection: safety glasses, face shield or goggles. Avoid vapors or mists. Use respiratory protection: Half-face Organic Vapor Filter Respirator Class A1P2 (AS/NZS 1715) if under 2 liters. Positive-pressure air-supplied respirator if there is potential of release and exposure levels are unknown. Long sleeved and full length 100% cotton shirt and pants and enclosed safety shoes. Wash hands before eating, drinking, smoking and using toilet. Eyewash station and safety shower should be provided.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Details the Appearance, Odor, Odor Threshold, pH, Melting Point/Freezing Point, Initial Boiling Point and Boiling Range, Flash Point, Evaporation Rate, Flammability (solid, gas), Upper/Lower Flammability or Explosive Limits, Vapor Pressure, Vapor Density, Relative Density, Solubility, Partition coefficient: n-octanol/water, Auto-ignition Temperature, Decomposition Temperature, and Viscosity.

Level 1- 5; First Responder Awareness through On-Scene Commander personnel should be trained and understand Section 9 Physical and Chemical Properties.
SECTION 9

PHYSICAL and CHEMICAL PROPERTIES

a) Appearance: Clear, colorless liquid
b) Odor: Strong ketone odor
c) Odor Threshold: 60 ppm (varies from 4 ppm-600 ppm)
d) pH: 7

e) Melting Point / Freezing Point: Melting point: NA
   Freezing Point: -95 degrees C.
f) Initial boiling point and boiling range: BP 133 degrees F.
g) Flash Point: 4 Degrees F
h) Evaporation rate: 5.7x faster than Butyl Acetate
i) Flammability: Flammable Liquid
j) Upper/ Lower Flammability or explosive limits: 2.6% to 12.8% (26,000 ppm to 128,000 ppm)
k) Vapor Pressure: C 200 mm HG @ 25 Degrees
l) Vapor Density: 2.0 (air = 1)
m) Relative Density: 0.79 Specific Gravity

ACETONE
SDS
SECTION 10

STABILITY AND REACTIVITY

Provides specific test data for chemicals and mixtures for stability and reactivity hazards. Information when available, or it may be based on the class or families of the chemicals when the information represents adequately the hazards of the chemical. Includes conditions to avoid and hazardous decomposition products.

Levels 2 -5; First Responder Operations through On-Scene Commanders personnel should be trained and understand Section 10 Stability and Reactivity.

ACETONE
SDS
SECTION 10

STABILITY AND REACTIVITY

a) Reactivity:
   - Reactive with Oxidizers, Sodium and Barium Hydroxide, Nitric Acid, Chromium Trioxide, Chromyl Chloride, Bromine,
   - Acetone is Stable will not polymerize.

b) Chemical Stability:

   - Violent explosive reaction with Chromic Anhydride, Potassium Tert Butoxide, Thioglycol Hexachlorophene and Trichloromelamine

c) Possibility of Hazardous Reactions:
   - Heat, Sparks, Open Flame and Confined Spaces

d) Conditions to avoid:
   - Incompatible Material:

   - Acids, Chloroform, Chromic Anhydride, Hydrogen Peroxide, Nitric Compounds and Oxidizers

   - Carbon Monoxide, Carbon Dioxide
SECTION 11 - TOXICOLOGICAL INFORMATION
Provides Medical Personnel, Occupational Health & Safety Professionals and Toxicologists with concise and comprehensive information on toxicology health effects that can be used to determine routes of exposure and symptoms, delayed and immediate effects and chronic effects from short- and long-term exposure.
Levels 2-6; First Responder Operations through Healthcare Professionals should be trained and understand Section 11, Toxicological Information.

ACETONE
SDS
SECTION 11
TOXICOLOGICAL INFORMATION
a) Routes of Exposure:
   Inhalation, Ingestion, Skin and Eyes
b) Symptoms related to the physical, chemical and toxicological characteristics:
   Inhalation:
   Dizziness, confusion, muscle weakness, nausea, vomiting and coma. May affect speech and motor skills when exposed in concentrations over 500 ppm. Concentration of over 10,000 ppm may cause collapse, coma and death.
   Ingestion:
   Irritation of Mouth and Gastrointestinal Tract. May affect Behavior, Sleep Times, Liver, Blood, Kidney, Bladder and Endocrine System. Collapse and coma have been reported when ingested in quantities under 7 ounces.
   Skin:
   May be harmful if absorbed through skin. May cause redness and dermatitis.
   Eye:
   Causes redness, tearing, inflammation and possible corneal clouding.
c) Delayed, immediate & chronic effects from short- and long-term exposure:
   1) Delayed effects from short-term exposure:
      May increase urination, thirst and blood sugar levels after 4 weeks for up to 5 months after ingestion.
   2) Immediate effects from short-term exposure:
      May cause irritation of throat and nasal passages from inhaling small amounts under 500 ppm. Flushed cheeks, appearance of intoxication, unconsciousness, collapse and coma when ingested in quantities of 7 ounces have been reported.
   3) Chronic effects from short-term exposure:
      Produced by the human body and will be primarily expelled through respiration over a short time period with no long term health effects.
   4) Delayed effects from long-term exposure: Not Available
   5) Chronic effects from long-term exposure:
      May include dry skin, sleeplessness, nausea, faintness, weight loss, eye irritation attacks of giddiness, and loss of strength.
   6) Immediate effects from long-term exposure
      Repeated exposure may cause dry skin and dermatitis
d) Numerical measures of toxicity

LC50 / LD50

Inhalation
Rat: LC50 = 50100 mg/m3/4 hr
Mouse: LC50 = 44 gm/m3/4 hr

Ingestion
Rat: LD50 = 5800 mg/kg
Mouse: LD50 = 3 gm/kg

Skin
Rat: LD50 = 3 gm/kg
Guinea pig: LD50 = 9400uL/kg

Eye Contact
Draize Rabbit: 20 mg/ 24 hr Severe
Rabbit: 20 mg/ 24 hr Moderate

Epidemiology:
Not Available

Teratogenicity:
Not Available

Reproductive Effects:
Paternal Effects - spermatogenesis, including genetic morphology, motility and count

Neurotoxicity: Not Available

Mutagenicity:
Sex chromosome loss and nondisjunction
(Yeast - Saccharomyces cerevisiae) = 47600 ppm;
Cytogenetic analysis (hamster Fibroblast ) = 40 gm / L

e) Carcinogenicity:
Under ACGIH, IARC, NTP AND OSHA no ingredient in this product is present > or = in 0.1% concentration that would be a confirmed, probable carcinogenic.

SECTION 12
ECOLOGICAL INFORMATION (Non-Mandatory)

SECTION 13
DISPOSAL CONSIDERATIONS (Non-Mandatory)

SECTION 14
TRANSPORT INFORMATION (Non-Mandatory)
SECTION 15
REGULATORY INFORMATION (Non-Mandatory)

SECTION 16 - DATE OF PREPARATION OR LAST REVISION AND OTHER INFORMATION
Provides the date that the SDS (Safety Data Sheet) was prepared or last revised by day, month and year. The
Responsible Party could also list any other information that they feel is relevant to the hazardous chemical
and not previously covered.

Levels 1- 6; First Responder Awareness through Healthcare Professionals should be trained and under-
stand Section 16  Date of Preparation or Retention and other Information.

COMPLETED SAFETY DATA SHEET

ACETONE
SDS
SECTION 16
DATE OF PREPARATION OR REVISION AND OTHER INFORMATION
August 22, 2013 LAST REVISED.

1) New Safety Data Sheet (SDS) and Container Labels Training required before Dec. 1, 2013
2) New Container Labels  in 29 CFR 1910.1200 Appendix C required by June 1, 2015
3) New Safety Data Sheets (SDS) in 29 CFR 1900.1200 Appendix D; by June 1, 2015

These are the three components of the new OSHA GHS 1910.1200 Hazard Communication Regulations that
manufacturers, importers and distributors will have to meet. The new GHS Safety Data Sheet and the Hazard
Communication Labels will soon provide information for communicating the Health and Safety Information to
workers in an easy to understand, standardized format that will allow workers who work with and come in
contact with hazardous chemicals to carry out their jobs safely and healthcare professionals to treat workers
with confidence.

This information is only an example of what a SDS could look like if we were trying to meet the new GHS re-
quirements and should never be used to the meet the actual Safety Data Sheet or GHS Container Label Reg-
ulations. You should consult 29 CFR 1910.1200 Hazard Communication Regulations. If you have input,
questions or comments on this entry or other Hazardous Chemical, Wastes or Substances, please call or
email me.

Thank you.

Robert Keegan
Publisher
Hazardous Materials Publishing

John Sabatino
Traci Greiss
Lisa Fricker
Editors
ACETONE

SECTION 1
IDENTIFICATION

a) Acetone
b) 2-Propanone, dimethyl ketone, ketone propane
c) Parts cleaning, laboratory reagent, cleaning solvent
d) ABC Chemical Co.
   243 W Main Street
   Oley Pa 19530
   Office Telephone 555-555-5556
   email: abcchemical@cmail.com
   Emergency Telephone; 555-555-5555
   24-hr/day and 7 days/week

SECTION 2
HAZARD(S) IDENTIFICATION

FLAMMABLE LIQUID CATEGORY 2
EYE IRRITATION CATEGORY 2A
SPECIFIC TARGET ORGAN TOXICITY SINGLE EXPOSURE CATEGORY 3
HIGHLY FLAMMABLE LIQUID AND VAPOR
CAUSES SERIOUS EYE IRRITATION
MAY CAUSE DROWSINESS OR DIZZINESS

i) Prevention
   No Smoking.
   Keep away from heat, sparks, open flame and hot surface.
   Ground/bond container and receiving equipment.
   Use explosion proof equipment.
   Use non sparking tools.
   Take precautionary measures against static discharge.
   Wash any exposed skin thoroughly after handling.
   Avoid breathing vapors or mist.
   Use only outdoors or in a well ventilated area.
   Wear protective gloves, eye protection, face protection.
ii) Response
   Use dry chemical or CO2 to extinguished
   If inhaled: remove person to fresh air and keep comfortable for breathing.
   If on skin or hair take off immediately all contaminated clothing. Rinse skin with water or shower.
   If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
   If eye irritation persists or if you feel unwell call Poison Center, Doctor or get medical attention

iii) Storage
   Store in a cool well ventilated place
   Keep container tightly closed

iv) Disposal

Other hazards: Not Available
Acute toxicity: Not Available

SECTION 3
COMPOSITION / INFORMATION ON INGREDIENTS
Except as provided for in paragraph (i) of 1910.1200 on trade secrets:

For Substances:
ACETONE
2-PROPANONE, Dimethyl Ketone, Ketone Propane
CHEMICAL FORMULA C3H6O
CAS # 67-64-1
Impurities and stabilizing additives which are themselves classified and which contribute to the classification of the substance:
NOT AVAILABLE
Hazardous Ingredients/Concentrations:
ACETONE (=>90% - <=100%)

SECTION 4
FIRST AID MEASURES
a) First aid Measures
General Advice:
Move from dangerous area, consult physician, provide SDS to attending medical personnel
If inhaled:
Move person to fresh air, give artificial respiration if not breathing and consult physician.

In case of contact with skin:
Apply plenty of water and wash with soap. Remove contaminated clothing. Consult a physician.

In case of eye contact:
Thoroughly and cautiously rinse with water for at least 15 minutes. Consult an ophthalmologist.

If swallowed:

b) Symptoms
   Symptoms include cough, headache, eye and throat irritation, dizziness, dermatitis at levels below 100 ppm and at higher levels may cause unconsciousness

c) Treatment
   Acetone has minimal toxicity on organ systems. Treatment of severe intoxication (narcosis) from exposure through ingestion or vapors is primarily supportive. If ingestion is recent removal by gastric lavage or activated charcoal may be prescribed.

SECTION 5
FIRE-FIGHTING MEASURES

a) Extinguishing Media:
   Dry chemical, carbon dioxide, foam or alcohol type foam. Do not apply water!

b) Specific Hazards:
   Extremely flammable liquid and emits extremely flammable and explosive vapors when mixed with ambient air. Vapors heavier than air and may travel along floor. May ignite when exposed to sparks, heat, flame or oxidants.

c) Special Protective Equipment and Precautions for fire-fighters:
   Personal Protective Equipment. PPE Level C recommended. Self-Contained Breathing Apparatus. Keep fire-exposed containers cool using water spray. Remove containers from fire area if can be done without risk.

SECTION 6
ACCIDENTAL RELEASE MEASURES

a) Personal precautions, Protective Equipment and Emergency Procedures: Avoid breathing vapors, gases or mists. Use proper Personal Protection Equipment. Ensure proper ventilation of fumes and vapors if can be done safely. Remove all sources of ignition. Vapors may travel considerable distance to low lying ignition sources. Evacuate to safe area.

b) Methods and Material for Containment and Cleanup: Contain large spills using dike or berm. Take up spilled material with inert absorbent material like earth, sand or vermiculite. Use non-sparking tools and equipment and avoid ignition sources. Do not let enter drains or waterways. Clean up small spills using paper towels, water and detergent and allow to evaporate in fume hood or cupboard. Place in non-plastic containers for transportation and disposal according to State, National and International Waste Regulations.
SECTION 7
HANDLING AND STORAGE

a) Precautions for Safe Handling: Avoid contact with skin and eyes. Do not inhale vapors or mists. Use in well ventilated areas. Do not use contact lenses. Explosion and flameproof engineering controls should be in place. Use non-sparking tools and equipment when necessary. Use techniques to eliminate accumulation of static charge when transferring material.

b) Conditions for Safe Storage including Incompatibilities: No smoking. Store in cool dry and well-ventilated area. Avoid direct sunlight. Store in securely closed original containers in an area designed for storage of Flammable Liquids under OSHA 29 CFR 1910.106. Empty containers may still contain residue and/or vapors and OSHA Hazard Communication labels may be still required. Store at 59-77 degrees F (15-25 degrees C). Avoid incompatible materials including acid, bases, oxidizers, nitrogen fluoride compounds, sulfates, perchlorates, reducing agents and plastics.

SECTION 8
EXPOSURE CONTROLS/PERSOAL PROTECTION

a) OSHA Permissible Exposure Limits 1910.1000
   Table Z-1 Limits for Air Contaminants
   TWA 1000 ppm (2400 mg/m3)
   ACGIH
   TLV 500 ppm
   8-hr exposure limit
   750 ppm 15 min STEL
   NIOSH
   IDLH 2500 ppm
   REL 250 ppm 10 hr/40 hr week
   TWA 250 ppm (590 mg/m3)

b) Appropriate Engineering Controls: Contents may be under pressure, caution when opening containers. Keep containers closed and in an upright position when not in use. Good ventilation required. Explosion-proof exhaust ventilation should be used (10 air changes per hour should be used). Use process enclosures, exhaust ventilation or other controls to maintain airborne levels below recommended exposure levels.

c) Individual Protection Measures: Wear butyl-rubber, nitrile or super nitrile gloves. Use eye protection: safety glasses, face shield or goggles. Avoid vapors or mists. Use respiratory protection: Half-face Organic Vapor Filter Respirator Class A1P2 (AS/NZS 1715) if under 2 liters. Positive-pressure air-supplied respirator if there is potential of release and exposure levels are unknown. Long sleeved and full length 100% cotton shirt and pants and enclosed safety shoes. Wash hands before eating, drinking, smoking and using toilet. Eyewash station and safety shower should be provided.
SECTION 9
PHYSICAL AND CHEMICAL PROPERTIES
a) Appearance: clear, colorless liquid
b) Odor: strong ketone odor
c) Odor Threshold: 60 ppm (varies from 4 ppm-600 ppm)
d) pH: 7
e) Melting Point/Freezing Point: Melting point: NA; Freezing point: -95 degrees C.
f) Initial boiling point and boiling range: BP 133 degrees F.
g) Flash point: 4 degrees F
h) Evaporation rate: 5.7x faster than Butyl Acetate
i) Flammability: Flammable Liquid
j) Upper/Lower Flammability or Explosive limits: 2.6% to 12.8% (26,000 ppm to 128,000 ppm)
k) Vapor Pressure: C 200 mm HG @ 25 degrees
l) Vapor Density: 2.0 (air=1)
m) Relative Density: 0.79 Specific Gravity
n) Solubilities: Soluble
o) Partition Coefficient: n-octanol/water: Not Available
p) Autoignition Temperature: 869 degrees F (465 degrees C)
q) Decomposition Temperature: less than 4 degrees C
r) Viscosity: 0.3075 cP

SECTION 10
STABILITY AND REACTIVITY
a) Reactivity: Reactive with oxidizers, sodium and barium hydroxide, nitric acid, chromium trioxide, chromyl chloride, bromine.
b) Chemical Stability: Acetone is stable. Will not polymerize.
c) Possibility of Hazardous Reactions: Violent explosive reaction with chromic anhydride, potassium tert butoxide, thiosylcol hexachlorophene and trichloromelamine
d) Conditions to Avoid: heat, sparks, open flame and confined spaces
e) Incompatible Material: acids, chloroform, chromic anhydride, hydrogen peroxide, nitric compounds and oxidizers
f) Hazardous Decomposition Products: carbon monoxide, carbon dioxide

SECTION 11
TOXICOLOGICAL INFORMATION
a) Routes of Exposure: inhalation, ingestion, skin and eyes
b) Symptoms related to the physical, chemical and toxicological characteristics:
   Inhalation: Dizziness, confusion, muscle weakness, nausea, vomiting and coma. May affect speech and motor skills when exposed in concentrations over 500 ppm. Concentrations of over 10,000 ppm may cause collapse, coma and death.
   Ingestion: Irritation of mouth and gastrointestinal tract. May affect behavior, sleep times, liver, blood, kidney, bladder and endocrine system. Collapse and coma have been reported when ingested in quantities under 7 ounces.
   Skin: May be harmful if absorbed through skin. May cause redness and dermatitis.
Eye: Causes redness, tearing, inflammation and possible corneal clouding.

c) Delayed, immediate & chronic effects from short- and long-term exposure:
   1) Delayed effects from short-term exposure: May increase urination, thirst and blood sugar levels after 4 weeks for up to 5 months after ingestion.
   2) Immediate effects from short-term exposure: May cause irritation of throat and nasal passages from inhaling small amounts under 500 ppm. Flushed cheeks, appearance or intoxication, unconsciousness, collapse, and coma when ingested in quantities of 7 ounces have been reported.
   3) Chronic effects from short-term exposure: Produced by the human body and will be primarily expelled through respiration over a short time period with no long term health effects
   4) Delayed effects from long-term exposure: NONE AVAILABLE
   5) Chronic effects from long-term exposure: May include dry skin, sleeplessness, nausea, faintness, weight loss, eye irritation, attacks of giddiness, and loss of strength
   6) Immediate effects from long-term exposure: Repeated exposure may cause dry skin and dermatitis

d) Numerical Measures of Toxicity
   LC50/LD50
   Inhalation
   Rat: LD50=50100 mg/m3 4 hr
   Mouse: LC50=44 g/m3 4 hr
   Ingestion
   Rat: LD50=5800 mg/kg
   Mouse: LD50=3 g/kg
   Skin:
   Rat: LD50=3 g/kg
   Guinea pig: LD50=9400 uL/kg
   Eye Contact:
   Draize Rabbit: 20 mg Severe
   Rabbit: 20 mg/24 hr Moderate
   Epidemiology: Not Available
   Teratogenicity: Not Available
   Reproductive Effects:
   Paternal Effects – spermatogenesis, including genetic morphology, motility and count
   Neurotoxicity: Not Available
   Mutagenicity: Sex chromosome loss and nondisjunction
   (Yeast – Saccharomyces cerevisiae)=47600 ppm;
   Cytogenetic analysis (hamster fibroblast)=40 g/L

e) Carcinogenicity: Under ACGIH, IARC, NTP and OSHA, no ingredient in this product is present equal to or above 0.1 concentration that would be a confirmed, probable carcinogenic.
SECTION 12
ECOLOGICAL INFORMATION (Non-Mandatory)

SECTION 13
DISPOSAL CONSIDERATIONS (Non-Mandatory)

SECTION 14
TRANSPORT INFORMATION (Non-Mandatory)

SECTION 15
REGULATORY INFORMATION (Non-Mandatory)

SECTION 16
DATE OF PREPARATION OR REVISION AND OTHER INFORMATION
August 22, 2013 last revised.