

IDENTIFICATION

TOPIC TITLE: Industrial Hygiene

MINIMUM TIME: 30 minutes

OBJECTIVES

Terminal Objective:

Given current OSHA and industry information regarding worksite illnesses, injuries, and/or fatalities, the student will be able to recognize how to protect themselves by using strategies to control industrial hygiene hazards.

Enabling Objectives:

1. Identify types of health hazards in the workplace.
2. Describe strategies to eliminate/control chemical hazards.
3. Describe strategies to eliminate/control biological hazards.
4. Describe strategies to eliminate/control physical hazards.
5. Describe strategies to eliminate/control ergonomic hazards.

INSTRUCTOR MATERIALS AND RESOURCES

- PowerPoint Presentation: *Industrial Hygiene*
- Knowledge Check Answer Key: *Industrial Hygiene*

STUDENT MATERIALS

- OSHA Fact Sheet: *Protecting Workers from the Effects of Heat*
- OSHA Quick Card: *Protecting Workers from Cold Stress*
- OSHA Quick Card: *If You Work Around Lead, Don't Take It Home!*
- OSHA Pocket Guide: *Protecting Yourself from Noise in Construction*
- Knowledge Check: *Industrial Hygiene*

NOTE: Content included in this topic is more than can be effectively delivered in a 30-minute session. Instructor needs to adjust delivery time and content to best meet the needs of the training audience.

TEACHING PROCEDURES ---Preparation, Presentation, Application, Evaluation

Anticipatory Set (Focus Attention/Gain Interest)

Estimated Time: ?? hours

Key Points	Methods
<p>Workers can be exposed to a variety of health hazards on a job site, including:</p> <ul style="list-style-type: none">• Chemical• Biological• Physical• Ergonomic <p>If not practicing good hygiene, these hazards can be brought home and expose family members as well.</p> <p>Protect yourself and your family by knowing what health hazards may be present at your jobsite and take appropriate actions for exposure control.</p> <p>Review lesson objectives.</p>	<p>PPT slides #1 – #3</p>

Presentation (Instruction)

Estimated Time: ?? hours

Key Points	Methods
<p>I. Health hazards in the workplace</p> <p>A. The science of protecting the health and safety of workers through anticipation, recognition, evaluation, and control of workplace conditions that may cause injury or illness to workers</p> <p>B. Types of health hazards in the workplace</p> <ol style="list-style-type: none">1. Chemical – solids, liquids, gases and vapors, aerosols2. Biological – insects, animals, soil, plants, water, blood3. Physical – noise, temperature extremes, radiation4. Ergonomic – lifting, holding, pushing, walking, reaching	<p>PPT slides #4 - #5</p>

- II. Exposure Effects of Chemical Hazards and Methods of Control
 - A. Chemical hazards exist in various forms – solids, liquids, dusts, fumes, mists, aerosols, fibers, smokes, gases, vapors
 - B. Risks to health and safety
 - 1. May pose risk of fire and explosion hazards
 - 2. May put workers at risk of developing health problems such as heart ailments, central nervous system damage, kidney damage, lung damage, sterility, cancer, burns, or rashes
 - 3. 190,000 illnesses caused by chemical exposure annually in the US
 - 4. 50,000 deaths caused by chemical exposure annually in the US
 - C. Exposure Entry Routes
 - 1. Inhalation
 - a. Breathed in
 - b. Most common means of exposure
 - c. Examples
 - i. Grinding/Cutting/Sawing/Sanding/etc.
 - ii. Painting/Spraying
 - iii. Cleaning
 - iv. Processing/Manufacturing/Reacting
 - v. Laboratory
 - vi. Welding fumes
 - vii. Nearby construction (Lead/Asbestos/Silica)
 - 2. Ingestion
 - a. Swallowed
 - b. Examples
 - i. Cross Contamination (food/water/cigarettes)
 - ii. Mucus Contamination (particulates)
 - 3. Absorption (Skin/Eye)
 - a. Drawn through skin or eye surface
 - b. Examples

PPT slides #6 - #19

- i. Unprotected for all potential airborne exposure
 - ii. Laboratory (Acids/Bases/Toxics)
 - iii. Cleaning/Solvents
 - iv. Product Handling
- 4. Injection
 - a. Penetration through the skin
 - b. Examples
 - i. Pressurized chemicals (Hydraulics)
 - ii. Industrial Hole Punching/Injection Processing
 - iii. Sharps (Needles)
- D. Effects of chemical exposures
 - 1. Signs of Exposure - examples
 - a. Dust/Mist/Smoke in the air
 - b. Accumulation of particulates on nearby surfaces
 - c. Unusual smells
 - d. Unusual tastes
 - e. Burning eyes
 - f. Nose/throat irritation
 - 2. Chemical exposure symptoms - examples
 - a. Eye, nose, throat, upper respiratory tract, and skin irritation
 - b. Flu-like symptoms
 - c. Difficulty breathing
 - d. Fatigue
 - e. Loss of coordination
 - f. Memory difficulties
 - g. Sleeplessness
 - h. Mental confusion
 - 3. Types of Health Effects
 - a. Acute exposure
 - i. Immediate body reaction
 - ii. Short-term; high concentration
 - iii. Example – Hydrogen sulfide exposure in a confined space
 - b. Chronic exposures (continuous; long-term)
 - i. Delayed body reaction; generally for years
 - ii. Continuous; for long periods of time

- iii. Example – asbestos exposure that leads to asbestosis
- 4. Damage to body
 - a. Toxicology – studies poisonous/toxic properties of substances
 - b. Toxic effects
 - i. Depends on concentration and duration
 - ii. Permanent versus reversible
 - iii. Localized (at the site of the exposure) versus systemic (affects entire body; target organs – hepatotoxins, nephrotoxins, neurotoxins, hematotoxins, anesthetics)
- 5. Factors affecting exposures
 - a. Physical form of chemical
 - b. Means of entry into the body
 - c. Toxicology (Dose, Concentration, and Duration)
 - d. Age, sex, race, and weight of individual
 - e. Metabolism, distribution, and excretion
 - f. Presence of other chemicals – multiple chemical interactions
 - i. Additive effects
 - ii. Synergistic effects
 - iii. Potentiation effects
 - iv. Antagonistic effects
- E. Methods of protecting workers against exposure to chemical hazards
 - 1. Control methods hierarchy
 - a. Elimination (Physically remove the hazard)
 - b. Substitution (Replace hazard with safer option)
 - c. Engineering controls (Isolate workers from the hazard)
 - d. Administrative controls (Change the way people work)
 - e. PPE (Protect workers with personal protective equipment)
 - 2. Worksite Analysis – assesses exposures
 - a. Air monitoring
 - b. Noise monitoring

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- c. Observation: PPE use and work practices
- d. Ventilation measurements
- e. Wipe samples: surfaces and personnel
- 3. Permissible Exposure Limits
 - a. OSHA regulations that establish acceptable amount/concentration of a substance in the workplace
 - b. Protect workers from adverse health effects related to chemical exposure hazards
 - c. Time-weighted average (TWA)
 - d. Ceiling limit (C)
- F. Potential standard-specific chemical hazards –
 - 1. OSHA standards for substances (mostly carcinogens) that identify specific requirements.
 - a. Workers potentially exposed to a substance with a specific standard must be monitored and protected in accordance with that specific standard.
 - b. A substance-specific standard may require integrated air monitoring or various forms of biological monitoring.
 - c. In general, substance specific standards require
 - i. Air monitoring
 - ii. Control of exposure (engineering, work practices, and/or respiratory protection)
 - iii. Medical surveillance/removal
 - iv. Recordkeeping
 - v. Training
 - 2. Examples of Substance-specific Standards
 - a. Hexavalent Chromium
 - i. Toxic form of chromium
 - ii. Cr(VI) compounds are man-made and widely used in many different industries
 - iii. Major source of exposure during “hotwork” on stainless steel and other alloy steels containing Cr(VI)
 - iv. Known to cause cancer
 - b. Asbestos exposure
 - i. May occur during nearby renovation,

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| <p>repairs, or demolition</p> <ul style="list-style-type: none">ii. Used in products such as insulation for pipes, floor tiles, building materials, and in vehicle brakes and clutches <p>c. Crystalline silica</p> <ul style="list-style-type: none">i. Abundant in earth's crust; most common form is quartz, which is found in materials such as brick and mortar, concrete, slate, granite, sandstone, stone aggregate, tile, and sandii. Crystalline silica is also found in asphalt filler, roofing granules, plastic composites, soils, wallboard joint compounds, paint, plaster, caulking, and puttyiii. Exposure through inhalation of small particles in air which occurs with common operations such as cutting, sawing, and drilling <p>d. Lead exposure</p> <ul style="list-style-type: none">i. Malleable, blue-gray, heavy metal that occurs naturally in the Earth's crustii. Can harm many of the body's organ systems; causes variety of ailments, such as neurological effects, gastrointestinal effects, anemia, and kidney diseaseiii. Occurs in most industry sectors, including manufacturing, wholesale trade, transportation, construction, remediation, and even recreation; production, use, repair, and recycling of products made of materials containing leadiv. Used in lead-based paints, lead solder, electrical fittings and conduits, tanks linings, plumbing fixtures, and many metal alloys <p>3. Welding fumes</p> <ul style="list-style-type: none">a. Contents of fumes depend on components of | |
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the base metal, coatings, and/or filler materials, as well as the temperatures used in the welding process

- b. Metal in fumes – aluminum, antimony, arsenic, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, silver, tin, titanium, vanadium, and zinc
- c. Gas by-products of welding
 - i. Shielding – argon, helium, nitrogen, carbon dioxide
 - ii. Process – nitric oxide, nitrogen dioxide, carbon monoxide, ozone, phosgene, hydrogen fluoride, carbon dioxide
- d. Exposure factors
 - i. Welding process
 - ii. Materials used
 - iii. Location
 - iv. Work practices
 - v. Air movement
 - vi. Use of ventilation controls
- 4. Toxic atmospheres
 - a. Confined spaces – storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, pipelines, and open-top spaces more than 4 feet in depth (pits, tubs, vaults, vessels)
 - b. Hazardous atmospheres – examples:
 - i. Oxygen-deficient
 - ii. Hydrogen sulfide
 - iii. Carbon monoxide

III. Exposure Effects of Biological Hazards and Methods of Control

A. Types of biological hazards

- 1. Contact with contaminated or disease-carrying soil, water, feces, animals (insects, rodents, etc.), or plants
- 2. Contact with human blood or bodily fluids, which may contain bloodborne pathogens such as HIV,

PPT slides #38 – #41

- Hepatitis B, Hepatitis C
- 3. Contact with biting or puncturing organisms
- 4. Pathogens causes diseases and illnesses, including, but not limited to:
 - a. Tetanus
 - b. H1N1 or Swine flu
 - c. Avian flu
 - d. West Nile virus
 - e. Lime disease
 - f. Bloodborne pathogens – HIV, Hepatitis B, Hepatitis C
- 5. Exposure to poisonous or harmful plants
 - a. Poison ivy, poison oak, poison sumac
 - b. Thorn-bearing plants
- 6. Exposure to animals and insects
 - a. Mosquitoes and other biting insects, ticks, spiders, scorpions
 - b. Snakes
 - c. Stray or wild animals
- B. Effects of exposure to biological hazards
 - 1. Relatively mild, allergic reactions
 - 2. Serious medical conditions, even death
 - 3. Most virulent and prevalent biological agents – anthrax, avian flu, bloodborne pathogens, botulism, foodborne disease, hantavirus, Legionnaires disease, mold, plague, ricin, SARS, smallpox, tularemia, viral hemorrhagic fevers
- C. Methods of protecting workers against exposure to biological hazards
 - 1. Practice universal precaution with blood and other bodily fluids
 - 2. Personal hygiene
 - 3. Proper first aid attention to cuts/scratches, especially on hands and forearms
 - 4. Proper ventilation/environmental controls
 - 5. Proper PPE
 - 6. Keep current on vaccinations
 - 7. Use insect repellent and wear clothing to ward off pathogen-carrying insects

8. Be alert for animals in hiding under materials or debris piles

IV. Exposure Effects of Physical Hazards and Methods of Control

A. Types of physical hazards

1. Extreme temperatures
 - a. Exposure occurs in both indoor and outdoor environments due to climate or working conditions
 - b. Temperatures affected by humidity level, wind speed, radiant heat, physical contact with hot or cold objects, and strenuous physical activity
2. Impact or vibrating tools
 - a. Hand-held and stationary tools that transmit vibration through a workpiece
 - b. Examples – chainsaws, mowers, drillers, air hammers, tractors, excavators, earth-moving equipment, and other large machinery
3. Radiation exposure – invisible, undetectable energy that travels through space
 - a. Extremely Low Frequency Radiation (ELF) – produced by power lines, electrical wiring, and electrical equipment; sources of intense exposure include ELF induction furnaces and high-voltage power lines
 - b. Radiofrequency (RF) and Microwave Radiation (MW) – sources include radio emitters and cell phones
 - c. Infrared Radiation (IR) – sources include furnaces, heat lamps, and IR lasers
 - d. Visible Light Radiation – different visible frequencies of the electromagnetic spectrum; lighting
 - e. Ultraviolet Radiation (UV) – sources include the sun, black lights, welding arcs, and UV lasers;
 - f. Lasers – emit optical radiations (UV, visible light, IR)
4. Noise exposure

PPT slides #42 – #57

- a. Short-term exposure to loud noises; long-term exposure to noise
 - b. Examples of noise sources – tools, equipment, and heavy machinery
 - c. Permissible Exposure Limit (PEL) is 90 dBA for 8-hour Time Weighted Average (TWA); this is the legal limit set by OSHA
 - d. OSHA and NIOSH recommend that worker exposure to noise be controlled below a level of 85 dBA for 8-hour TWA
- B. Effects of exposure to physical hazards
- 1. Exposure to cold temperatures
 - a. Hypothermia
 - i. Body temperature drops to or below 95°F
 - ii. Impaired muscular and brain functions
 - iii. Symptoms – uncontrolled shivering, fumbling hands/clumsy movements, slurred speech, memory loss, erratic behavior, cool bluish/purple-colored skin
 - b. Frostbite
 - i. Freezing body tissue – exposed skin susceptible when air temperature is below 0°F or when cold temperatures are combined with high winds
 - ii. Leads to tissue damage, scarring, and possible amputation
 - iii. Symptoms – pale, waxy-white skin color that is cool to touch; tingling, stinging, or aching feeling in exposed area, followed by numbness; ears, fingers, toes, and cheeks are areas primarily affected; freezing of muscles and tendons, causing areas to become numb, painless, and hard to the touch
 - c. Trench foot
 - i. Result of prolonged exposure of lower extremities to cold (32°F to 50°F) and moisture
 - ii. Usually develops slowly, over a period of

- hours to days
- iii. Symptoms – initially, reddened skin, which later becomes pale and swollen; numbness, followed by leg cramps; blister formation, followed by ulceration
- 2. Exposure to hot temperatures
 - a. Heat rash – most common problem
 - i. Caused by sweating
 - ii. Looks like red cluster of pimples or small blisters; usually appears on neck, upper chest, in the groin, under the breasts, and in elbow creases
 - b. Heat cramps
 - i. Usually occurs after prolonged exposure to heat; heavy sweating depletes body of salt and moisture
 - ii. Painful cramps in abdomen and other muscles as result of decreased salt
 - iii. Signs/symptoms – muscle pains or spasms in abdomen, arms, or legs; sick feeling in the stomach
 - c. Heat exhaustion – serious condition
 - i. Caused by loss of large amounts of fluids and sometimes excessive loss of salts due to sweating during work/exercise in hot environment
 - ii. Signs/symptoms – dizziness/light-headedness; weakness; heavy sweating; pale skin color; feeling sick to stomach; vomiting; irritability; fainting; moist, clammy skin
 - d. Heat stroke – most serious condition
 - i. Serious medical condition that requires immediate attention; occurs when body is unable to control its temperature
 - ii. Body's temperature rises rapidly, sweating is diminished or absent, and body is unable to cool down; body temperature could rise to 104°F or higher within 10-15 minutes

- iii. Warning signs – red, hot, dry skin; rapid, strong pulse; body temperature $\geq 104^{\circ}\text{F}$; confusion; throbbing headache; dizziness; feeling sick to stomach; unconscious
- 3. Impact/vibrating hazards
 - a. “White fingers” or Raynaud’s Syndrome
 - i. Blood vessels in fingers collapse due to repeated exposure to vibration
 - ii. Skin and muscle tissues do not get enough oxygen and will eventually die
 - b. Hand-Arm Vibration Syndrome (HAVS)
 - i. More advanced condition; entire hand or arm may be affected by exposure to vibration
 - ii. Early signs – infrequent feelings of numbness and/or tingling in fingers, hands, or arms, or numbness and whiteness in the tip of the finger when exposed to cold
 - iii. Disease progression – more frequent attacks of numbness, tingling, and pain; difficult to use hands; may disable worker for a long period of time
 - c. Fatigue
 - d. Strains
- 4. Radiation
 - a. Danger from radiation increases with:
 - i. Lengthening duration of exposure
 - ii. Shortening distance from source
 - b. Stochastic health effects – associated with long-term, low-level (chronic) exposures
 - i. Cancer
 - ii. DNA mutations
 - c. Non-stochastic health effects – appear in cases involving exposure to radiation at high levels; short-term, high-level (acute) exposure
 - i. Burns
 - ii. Radiation sickness – nausea, weakness, hair loss, skin burns, or diminished organ function

- iii. Can cause premature aging or even death
- 5. Noise
 - a. Hearing loss – temporary or permanent
 - b. Tinnitus (ringing in the ears)
 - c. Physical and psychological stress, reduced productivity, interference with communication and concentration
 - d. Signs that workplace is too noisy – ringing in ears after leaving work; having to shout to be heard by co-worker an arm's length away; frequent headaches; experiencing temporary hearing loss when leaving work
- C. Methods of protecting workers against exposure to physical hazards
 - 1. Extreme temperatures
 - a. Use engineering controls, such as heaters and wind shields or air-conditioning and ventilation
 - b. Adjust work schedules and practices to combat effects of exceedingly cold or hot weather
 - c. Wear appropriate clothing for climatic conditions
 - d. Use PPE such as cold weather hoods, cooling vests, and hard hat liners
 - 2. Impact/vibrating tools or equipment
 - a. Use tools designed to reduce vibrations
 - b. Allow machine to do the work; do not grip too tightly
 - c. Maintain machines in proper working order
 - d. Alternate tasks using vibrating and non-vibrating tools
 - e. Training
 - f. PPE
 - 3. Noise reduction
 - a. Use equipment and systems that operate quietly
 - b. Enclose or shield noisy equipment; erect sound barriers
 - c. Keep equipment in good repair and properly maintained

- d. Use special mounts that reduce noise from vibrations
- e. Install silencers, mufflers, or baffles
- f. Weld parts rather than rivet
- g. Use acoustical material on floors, ceilings, and walls
- h. Use distance between source and receiver
- i. Provide hearing protection

V. Exposure Effects of Ergonomic Hazards and Methods of Control

PPT slides #58 – #61

A. Effects of exposure

1. Musculoskeletal disorders (MSDs)
 - a. Examples – carpal tunnel syndrome, tendinitis, rotator cuff injuries, epicondylitis, trigger finger, muscle strains, and low back injuries
 - b. Affects many different industries and occupations
2. Risk factors for MSDs
 - a. Increases a worker's risk of injury
 - b. Examples
 - i. Exerting excessive force
 - ii. Performing the same or similar tasks repetitively
 - iii. Working in awkward postures or being in the same posture for long periods of time
 - iv. Localized pressure into the body part
 - v. Cold temperatures
 - vi. Vibration
 - vii. Combined exposure to several risk factors

B. Control methods

1. Engineering controls – ergonomically designed tools, lifting devices, ergonomically designed workstations
2. Administrative – use correct work practices, such as proper lifting techniques, asking for help when lifting heavy/bulky/awkward loads
3. PPE – properly fit PPE

10-hour General Industry Outreach

<i>Application (How students apply what they learn)</i>	<i>Estimated Time: ?? hours</i>
Key Points	Methods
Have students identify health hazards in their workplace and how they are controlled. Provide a scenario in which a worker is exposed to several health hazards (chemical, physical, and biological) over the course of an extended period of time. Have the students identify the health hazards the worker is exposed to, and have them provide appropriate control measures.	PPT slide #62
<i>Evaluation/Summary</i>	<i>Estimated Time: ?? hours</i>
Key Points	Methods
Knowledge check: Industrial Hygiene	PPT slides #63 - #66
<i>References</i>	

OSHA Standard

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9696

29 CFR 1910

OSHA Publications

- **Job Hazard Examples**

https://www.osha.gov/dte/library/industrial_hygiene/industrial_hygiene.pdf

- **Chemical Exposure Figures**

https://www.osha.gov/dsg/safer_chemicals/index.html

- **Asbestos**

<https://www.osha.gov/pls/publications/publication.athruz?pType=Industry&pID=48>

- Asbestos Fact Sheet (OSHA FS 3507 - 2014) (English: [HTML](#) [PDF](#)) (OSHA FS-3737 - 2014) (Spanish: [PDF](#))
- Asbestos: Protecting Workers from Asbestos Hazards Fact Sheet (English: [HTML](#) [PDF](#))
- Asbestos: Protecting Workers from the Hazards of Asbestos-Containing Flooring Material Maintenance Fact Sheet (OSHA FS 3693 - 2013) (English: [PDF](#))

- **Beryllium**

- Beryllium: Health Effects of Exposure to Beryllium Fact Sheet (OSHA FS 3822 – 2015) (English: [PDF](#))

- **Hexavalent Chromium**

<https://www.osha.gov/pls/publications/publication.athruz?pType=Industry&pID=105>

- Hexavalent Chromium (OSHA 3373 - 2009) (English: [PDF](#))
- Hexavalent Chromium: Controlling Exposure to Hexavalent Chromium in Aerospace and Air Transport Painting (OSHA FS-3650 - 2013) (English: [HTML](#) [PDF](#))
- Hexavalent Chromium: Controlling Hazardous Fume and Gases during Welding Fact Sheet (OSHA FS-3647 - 2013) (English: [HTML](#) [PDF](#))
- Hexavalent Chromium: Controlling Hexavalent Chromium Exposures during Electroplating (OSHA FS-3648 - 2013) (English: [HTML](#) [PDF](#))
- Hexavalent Chromium: Small Entity Compliance Guide for the Hexavalent Chromium Standards (OSHA 3320 - 2006) (English: [PDF](#))

- **Lead**

<https://www.osha.gov/pls/publications/publication.athruz?pType=Industry&pID=122>

- Lead Hazards Fact Sheet (English: [HTML](#) [PDF](#))
- Lead: If You Work Around Lead, Don't Take it Home! QuickCard (OSHA 3680 - 2014) (English: [PDF](#)) (OSHA 3736 - 2014) (Spanish: [PDF](#))

- **Silica**

<https://www.osha.gov/pls/publications/publication.athruz?pType=Industry&pID=192>

- Crystalline Silica Fact Sheet (English: [PDF](#))
- Crystalline Silica Fact Sheet (Spanish: [PDF](#))

- **Medical Screening and Surveillance**

<https://www.osha.gov/SLTC/medicalsurveillance/index.html>

- **Noise and Hearing Conservation**

<https://www.osha.gov/pls/publications/publication.athruz?pType=Industry&pID=145>

- Hearing Conservation (OSHA 3074 - 2002) (English: [HTML](#) [PDF](#))

- **Cold**

<https://www.osha.gov/pls/publications/publication.athruz?pType=Industry&pID=38>

- Cold Stress QuickCard (OSHA 3156 - 2014) (English: [PDF](#))

- **Heat**

<https://www.osha.gov/pls/publications/publication.athruz?pType=Industry&pID=104>

- Heat Hazards: Working Outdoors in Warm Climates Fact Sheet (2005) (English: [HTML](#) [PDF](#))
- Heat Illness: Campaign to Prevent Heat Illness Information Sheet 2014 (OSHA 3667 - 2014) (English: [PDF](#)) (OSHA 3667 - 2014) (Spanish: [PDF](#))
- Heat Illness: Protecting Workers from the Effects of Heat Fact Sheet (OSHA FS -3743 - 2014) (English: [HTML](#) [PDF](#))
- Heat Illness: Protecting Yourself in the Sun (OSHA 3166 - 2003) (English: [HTML](#) [PDF](#)) (OSHA 3168 - 2000) (Spanish: [HTML](#) [PDF](#))
- Heat Stress QuickCard™
Exposure to heat can cause illness and death. Learn of precautions your employer should take any time temperatures are high and the job involves physical work. 2 pages (OSHA 3154 - 2014) (English: [PDF](#)) Spanish (OSHA 3417 - 2011) (Spanish: [PDF](#)) Vietnamese (OSHA 3389 - 2011) (Vietnamese: [PDF](#))
- Heat Stress Wallet Card (OSHA 3556 - 2012) (English: [PDF](#)) (OSHA 3663 - 2013) (Portuguese: [PDF](#)) (OSHA 3565 - 2012) (Spanish: [PDF](#))

- **Bloodborne Pathogens**

- Bloodborne Pathogens - Bloodborne Pathogen Exposure Incidents Fact Sheet (2011) (English: [HTML](#) [PDF](#))
- Bloodborne Pathogens - Hepatitis B Vaccination Protection Fact Sheet (2011) (English: [HTML](#) [PDF](#))
- Bloodborne Pathogens - OSHA's Bloodborne Pathogens Standard Fact Sheet (2011) (English: [HTML](#) [PDF](#))
- Bloodborne Pathogens - Personal Protective Equipment (PPE) Reduces Exposure to Bloodborne Pathogens Fact Sheet (2011) (English: [HTML](#) [PDF](#))

- Bloodborne Pathogens - Protecting Yourself When Handling Contaminated Sharps Fact Sheet
(2011) (English: [HTML](#) [PDF](#))

- **Mold and Fungi**

<https://www.osha.gov/pls/publications/publication.athruz?pType=Industry&pID=140>
Mold Fact Sheet (2005) (English: [PDF](#))

- **Hazard Communication**

- Hazard Communication Standard: Dec. 1st, 2013 Training Requirements for the Rev. Standard Fact Sheet (OSHA FS 3642 - 2013) (English: [HTML](#) [PDF](#))
- Hazard Communication Standard: Labels and Pictograms – Brief (OSHA BR-3636 - 2013) (English: [PDF](#))
- Hazard Communication Standard: Safety Data Sheets - Brief (OSHA BR-3514 - 2013) (English: [HTML](#) [PDF](#))

OSHA References/Resources

- *Hazard Identification* (07/2014), OSHA eTool
<https://www.osha.gov/hazfinder/index.html>
- *Noise and Hearing Conservation* (01/2005), OSHA eTool
<https://www.osha.gov/dts/osta/otm/noise/index.html>