

**ECTOR COUNTY
SAFETY ACKNOWLEDGEMENT POLICY**

It is the intent of Ector County to provide a safe environment for its employees to work. In order for these conditions to be met, Ector County has developed a number of Safety Policies it believes will promote a reasonably safe place for each employee to work; however, improvement is always possible and additional recommendations are welcomed and encouraged.

It is also the intent of Ector County for its employees to perform the work assigned in a safe manner; therefore, each employee has a responsibility to Ector County. These responsibilities include but are not limited to, the requirement to advise the supervisor when the employee does not know how to perform the work assigned, never to endanger other employees, report all unsafe conditions and injuries to the supervisor, and follow all Safety Policies established by Ector County. Supervisors have the responsibility to only assign work to employees who are qualified through training or work experience, to train the employee to perform their duties in a safe manner or environment and follow Ector County Safety Policies.

Employees are required to follow all Safety Policies of Ector County. Failure to adhere to Ector County Safety Policies may subject the employee to disciplinary action, up to and including termination. All existing employees are required to acknowledge that they have read and understand Ector County Safety Policies. All new employees are required to acknowledge they have read, understand and will follow Ector County Safety Policies before commencing employment.

Employee Name: _____

Date: _____

Position: _____

Employee Signature: _____

**ECTOR COUNTY
HAZARDOUS MATERIALS COMMUNICATION POLICY**

All chemicals can be a potential physical or health hazard; therefore, it is the policy of Ector County that compliance with the Federal Codes and State Rules and Regulations will be strictly followed by employees and supervisors.

Each Department in Ector County Shall prepare a list of all solid, liquid and gaseous chemicals being used or stored at all locations where employees congregate to perform their assigned duties. It shall be the responsibility of the department's elected official, manager or supervisor to have prepared the aforementioned list and contact the chemical manufacturer and obtain the corresponding Material Safety Data Sheets (MSDS) for each of the chemicals indicated on the list. The MSDS sheets shall be placed in a protective prominently labelled binder that is accessible to all employees. The chemical list and MSDS sheets will be kept current and cross checked quarterly and updated as necessary by the responsible department head.

When ordering replacement chemicals, the Purchasing Department shall require as part of the purchase, that the manufacturer provide one copy of the MSDS sheets by return mail and one copy of the MSDS sheets be attached or accompany the delivery of the materials. No materials will be accepted without the simultaneous delivery of the corresponding MSDS sheets. All chemicals that are delivered must be labelled by the receiving employee immediately. Only industry standard government approved labels will be used. Labels will be affixed to the container in a conspicuous location where employees can readily identify the material.

It shall be the responsibility of the department's elected official, manager or supervisor to train or have trained all employees who may come in contact with chemical hazards in the following areas:

1. The hazards of the chemicals being used.
2. Method and observations - such as visual appearance or smell - workers can use to detect the presence of a hazardous chemical to which they may be exposed.
3. To be able to locate and understand how to read an MSDS sheet.
4. How to properly use the material in a safe manner.
5. What personal protective equipment is required while using the material.
6. Proper use of required personal protective equipment.
7. Emergency response and clean up procedures to follow in the event of a contaminating incident of spill.

**ECTOR COUNTY
SUGGESTED EMERGENCY RESPONSE POLICY**

In the event an accident occurs, each employee shall take the necessary Emergency Response as outlined below:

PERSONNEL INJURIES

If an employee is injured, it is the responsibility of other employees' in the immediate area to assist the injured. The senior employee on site shall have the responsibility to assess the severity of the injury and is authorized to take action as indicated below:

- Provide first aid to injured.
- Take injured to the Counties designated physician of clinic.
- Contact Emergency Medical Services (EMS) or Ambulance Service.

For severe injuries, provide First Aid as necessary, make the injured as comfortable as possible, (but do not move the injured party), and call or have another employee call:

(911)

If the injury is not severe but needs a physicians attention, the senior employee shall escort the injured employee to:

- Doctor of choice.
- Dr. Schmidt of Primary Medical at University and West County Road.
- Dr. John Hundley and Dr. John Puckett of Primary Medical at 4702 E. University.

FIRE EMERGENCIES

If a fire emergency occurs it is the responsibility of each employee to follow these basic rules in the order indicated.

- Remove any injured persons from and further danger.
- Sound an alert to make any persons in the immediate area aware of the fire emergency.
- Evacuate the facilities.
- Call the Fire Department at: 911
- Attempt to extinguish the fire using the proper type of equipment or extinguishers.

BOMB THREAT OR EMERGENCY

In the event of a Bomb Threat or Emergency, all employees should evacuate the endangered facilities a sufficient distance to prevent injury from flying glass and debris and call:

(911)

HAZARDOUS MATERIAL INCIDENT

Chemical spills or exposure to chemical accidents can be extremely hazardous. Often the chemicals involved can change from a dormant to volatile conditions upon exposure to the environment or contact with other materials including air, earth or water. All employees must evacuate any area where a hazardous material incident occurs and then call:

(911)

(Caution!!! - Local Fire or Police units may not have the required certifications or equipment to respond or clean up an incident; therefore, some investigation into defining a qualified source to respond.)

IDEAS FOR DEPARTMENTAL SAFETY RULES

The following safety rules are organized according to specific tasks and equipment. It is recommended that each department head review these suggested rules and incorporate the appropriate rules into the department's safety rules. The department head is reminded that the employees may also be used as a valuable source of input.

ECTOR COUNTY GENERAL SAFETY RULES

The following general rules should be applicable to all work areas. These rules, together with those developed by the combined efforts of the department heads and their employees, should prove helpful in promoting safety consciousness and reducing accidents. The rules for specific job functions should be adopted on a departmental basis.

1. Employees shall receive authorization from a supervisor before they turn on, use, repair or operate any machine, tool, vehicle, crane, electricity, gas, steam, air, acid, caustic or other dangerous material or equipment.
2. Safety guards or devices furnished by Ector County or the department shall be used. Removal or non-use may be authorized only by the supervisor and approved by the department.
3. Approved personal protective equipment shall be worn whenever the exposure indicates the need for it, i.e., head and ear protection, respiratory equipment, safety belts, protective footwear, etc. (See "Personal Protective Equipment" for details.)
4. Only a tool, equipment, etc. that is properly maintained and adjusted may be used.
5. Tools may not be modified unless authorized by a supervisor.
6. Floors must be kept free of paper clips, pencils, rubber bands, trash, coffee, food, and any other material or substance that might constitute a slipping or tripping hazard. Employees responsible for any such material or substance spilled shall clean it up immediately.
7. Employees shall refrain from horseplay, running and practical jokes when they are inside county buildings, because of potential slipping, tripping and collision hazards.
8. Immediately report all injuries to your supervisor.

CLOTHING AND SAFE DRESS

1. Employees will wear clothing appropriate to their work assignments. Clothing will be in reasonably good condition and clean. Dirty clothes are a menace to health.
2. Supervisors are responsible for ensuring that employees are informed as the requirements for wearing apparel that is suitable for the type of work to be performed and the hazards involved.

3. For those working with machinery or in other hazardous operations, shirts, blouses, trousers, slacks, coveralls, etc. should be well fitted, with no loose or flowing appendages. Sleeves, if full length, should be buttoned at the wrist. The practice of working with out a shirt is not encouraged.
4. Unless working conditions dictate otherwise, employees must wear shoes while at work. Shoes should be well-fitted with good soles and heels and of a style that completely covers the foot. Open-toe shoes, or lightweight shoes of the canvas "sneaker" type may not be safe. Safety shoes or safety toe caps are mandatory in foot-hazardous work.
5. Employees with long hair who work around moving machinery must wear adequate hair covering to preclude the possibility of entanglement.
6. Jewelry such as rings, pendants, necklaces, earring, watches, etc., shall not be worn whenever they constitute a hazard, i.e., working around moving machinery, electrical or electronics equipment, etc.

SAFETY RULES FOR PERSONAL PROTECTIVE EQUIPMENT

GENERAL

1. Protective equipment for eyes, face, head and extremities, protective clothing, respiratory devices, and protective barriers shall be provided and used wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.
2. Where employees provide their own protective equipment, the department shall be responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment.
3. Protectors shall meet the following minimum requirements:
 - a. They shall provide adequate protection against the particular hazards for which they are designed.
 - b. They shall be reasonably comfortable when worn under the designated conditions.
 - c. They shall fit snugly and shall not unduly interfere with the movements of the wearer.
 - d. They shall be durable.
 - e. They shall be capable of being disinfected.
 - f. They shall be easily cleanable.
4. Personal protective equipment shall comply with the standards of The American National Standards Institute, Bureau of Standards, or other recognized authorities.
5. Protectors shall be maintained in a sanitary and reliable condition at all times. Safety devices, including protective clothing worn by the employee, shall not be interchanged among the employees until properly cleaned. Where it has been determined that ordinary cleaning will not remove risk of infections, additional precautionary measures may be required.

BODY

1. Body protection may be required for employees whose work exposes parts of their body, not otherwise protected as required by other sections of this chapter, to hazardous substances or objects.
2. Clothing and protective clothing appropriate for the work being done shall be worn at all times. This may include laboratory coats, raincoats, aprons, full jump suits, bright reflective vest, etc.
3. Clothing saturated or impregnated with flammable liquids, corrosive substances, irritants or

oxidizing agents shall be removed and shall not be worn until properly cleaned.

EAR

1. Wherever it is not feasible to reduce the noise levels or duration of exposures to those specified by the county safety rules, ear protection devices shall be provided by the County and used by the employees.
2. All supervisors whose employees are engaged in noise hazardous operations or who work in noise hazardous areas, will be responsible for ensuring the use of approved hearing devices.
3. Each employee must wear an appropriate hearing protective device whenever exposed to hazardous noise. (Hazardous noise is determined to exist when it is difficult to hear a loud spoken voice at a distance of one(1) foot. The wearing of a hearing protective device when required is a condition of employment.
4. Full ear muff-type hearing protective devices are generally recommended.
5. Ear protective device inserted directly in the ear shall be fitted or determined individually by competent persons.
6. Plain cotton is not an acceptable protective device.
7. Ear protectors should be washed with mild soap and water after use. Dirty equipment may cause the ear to become sore and inflamed.

EYES AND FACE

1. Employees working in locations where eye hazardous substances, or injurious light rays are inherent in the work or environment, shall be safeguarded by means of face or eye protection. Suitable screens or shield isolating the hazardous exposure may be considered adequate safeguarding for nearby employees.
2. The employer shall provide and the employee shall be provided with protective eyewear by the county on a temporary basis.
3. All visitors who are exposed to eye hazardous areas shall be provided with protective eyewear by the county on a temporary basis.
4. Face and eye protection equipment shall be kept clean and in good repair. The use of this type of equipment with structural or optical defects shall be prohibited.
5. Only safety eyewear or facewear which means the American National Standards Institute (ANSI) - Z87 standard is permitted. Even personal "streetwear" which has the FDA approved impact-resistant lenses cannot be substituted for industrial type equipment. The latter offers a far greater degree of protection.

6. To protect against radiant energy when welding, burning or cutting the use of welding type filter lenses shall conform to the following shade specifications.

Arc weld over 400 amps	Shade 14
Arc weld 200- 400 amps	Shade 12
Arc weld 75-200 amps	Shade 10
Arc weld 30-75 amps	Shade 8
Heavy gas weld and cutting	Shade 8
Arc weld up to 30 amps	Shade 6
Medium gas weld and cutting	Shade 6
Light gas weld, cutting and brazing	Shade 5/4

7. Full face shield, chemical splash goggles or hoods with shields, as appropriate, shall be worn when exposed to or handling caustics, acids, or cryogenic liquids.
8. In laboratories, it may at times be necessary to perform demonstrations involving potentially hazardous operations so that employees can observe certain reactions. Transparent shields or barricades may be used for this purpose. However, even if a shield or barricade is utilized, the demonstrator and employees are at increased risk, and must therefore wear adequate personal eye protection.
9. Persons who wear contact lenses face additional eye dangers. In eye hazard areas, they are required to wear full goggles instead of safety glasses.

FEET

1. Appropriate foot protection shall be required for employees who are exposed to foot injuries from hot, corrosive, poisonous substances, falling objects, crushing or penetrating actions, which may cause injuries, or who are required to work in abnormally wet locations.
2. Footwear which is defective or inappropriate to the extent that its ordinary use creates the possibility of foot injuries shall not be worn.
3. Safety footwear shall meet the requirements of the applicable ANSI Standard.
4. Full coverage type safety, work, or dress shoes must be worn in all shops, laboratories, and other areas that are designated as foot hazard areas. Open type, high heel, or canvas shoes shall not be worn in these areas.

HANDS

1. Protection for the hands may be required for employees whose work involves unusual and excessive exposure to cuts, burns or to corrosive, irritating, allergenic or other harmful substances.
2. The department shall exercise great care in the supervision of employees with relation to the wearing of gloves when working around machinery. The wearing of gloves by a machine operator is not advisable, and the wearing of gauntlet-type or loose-cuff-type glove around

any moving machinery should not be permitted.

3. Employees performing industrial work should equip themselves with general purpose gloves for hand protection against various hazards.
Cotton or fabric gloves are suitable for protection against dirt, silvers, chafing or abrasions. Leather gloves are more effective in resisting moderate heat, chips, and rough objects. Special purpose gloves such as chrome-tanned leather gloves such for welders, rubber gloves, chemical-resistant gloves, etc., should also be considered.
4. Generally, the recommended types of glove for chemical handling are: vinyl plastic, natural latex and neoprene. Consult the manufacturer specifications as each is not satisfactory for all types of chemicals.

HEAD

1. Employees working in areas where there is a possible danger of head injury from impact, or from falling or flying objects, or from electrical shock and burns, shall be protected by protective helmets.
2. Helmets for the protection of employees against impact and penetration of falling and flying objects shall meet the applicable ANSI Standard, Industrial Head Protection.
3. Helmets for the head protection of employees exposed to high voltage electrical shock and burns shall also meet the applicable ANSI Standard.

LIFTING PROCEDURES

In general, the limit of fifty pounds for men and twenty-five pounds for women has been established for continuous or repetitive lifting. Regardless of the weight, always size up the load. Make sure you can handle it by yourself. If not, get help!

SAFETY RULES FOR COPY MACHINES

1. There are two basic types of office copy machines. (a) dry photo copiers that use a powder type toner material, and (b) wet photo copiers that sometimes use a combustible hydrocarbon-based toner.
2. All photocopiers, regardless of manufacturer, emit fumes at varying levels. In addition, some individual units and/or brands are more odorous than others. To date, tests have shown that none of the dry or wet photocopiers have been determined to present a health hazard to the users. However, it is recommended that all copiers be located only in work areas which have adequate ventilation. In addition, copiers should be so located that they are a minimum of 10 feet from any regular employee work station.
3. Duplicating machines that use spirit fluids are potentially hazardous because these fluids usually contain methanol, and/or other toxic and explosive chemicals. Therefore, these types of duplicating units require considerable ventilation. Outlined below are several ways to keep exposure to duplicating fluid hazards to a minimum.
 - a. Adjust machines so that minimum of fluid is used.
 - b. Locate machine in adequately ventilated room larger than 100 square feet.
 - c. Keep exposures to a minimum by limiting the operating time.
 - d. Methanol is extremely flammable, and a type ABC fire extinguisher should be located near the room.
 - e. Do not permit smoking or eating while operating the machine, and keep open flames away from machine or fluid.
 - f. Do not store cans of duplicating fluid in cardboard boxes near the machine. For fire safety, these cans should be stored in metal cabinet which is in a cool location.

FLEXIBLE ELECTRIC CORDS

1. Flexible cords shall be maintained in good repair and must bear the Underwriters Laboratory label (UL) or meet standards of the NFPA 70. Do not use cords that are frayed or damaged.
2. Flexible cords should be short (6-8 feet in length), limited to temporary use, and never cross traveled pathways unless suitable protected to avoid damage and the creation of tripping hazards.
3. Two-wire flexible cords and adaptor plugs are not permitted, since equipment is not grounded when connected to them.
4. Under no circumstances shall any flexible cord or electrical cord be spliced, except by certified electricians.
5. Never tack cords to the wall, etc., and keep cords away from pin-points and hot or wet surfaces. Never string cords across the ceiling, over pipes, or near sinks, and never place cords and plugs under physical stress or tension (see "Electrical Safety," for additional details.)

WASHING WITH SOLVENTS

1. Flammable liquids shall not be used to clean floors, work benches, or other large surface areas.
2. The substance listed below shall not be used to clean machines, equipment, furniture or parts thereof except;
 - a. In an adequately ventilated location.
 - b. In vapor degreasers designed for use with a specific materials, in similar units designed for such application.
 - c. In vented, totally enclosed systems.
 - d. Outdoors, in quantities of one gallon or less.

List of substances

Carbon disulfide
Chloroform
Ether
Pentachloroethane
Tetrachloroethane
Trichloroethylene

OFFICE SAFETY

1. Pencil sharpeners shall not be installed where they might be striking hazards.
2. Electric cords on machines and desk lamps must be kept in good repair. Cords are to be replaced when outer insulation is broken.
3. All fans shall be equipped with suitable guards. Fans shall not be placed where they might be struck.
4. Thumbtacks and other sharp pointed objects should be kept in containers, not loose in desk drawers.
5. Individual upright shelves, lockers and cabinets will be fastened to floor or walls, if the possibility of overturning exists. Where there are two (2) or more, they will be fastened together.
6. Not more than one (1) drawer of a file cabinet may be open at one time. Drawers should not be left open when not in use.
7. When it is necessary to store material on top of lockers or file cabinets, due regard must be given to the weight, shape and stability of the material.
8. Have defective chairs repaired or replaced promptly.
9. Do not tilt back in straight chairs.
10. Extreme care must be exercised when cleaning glass used for desk tops.
11. Use knives, razor blades, scissors or shears with care. Cutting edged instruments will be sheathed when not in use.
12. Paper cutters shall be equipped with a safety bar. Blade spring tension will be adjusted so that the blade will not fall of its own weight.
13. Desks shall be arranged so that electrical and telephone outlets and leads are not tripping hazards.
14. Splintered or jagged edges, or other defects found on office furniture will be promptly repaired or the equipment replaced.
15. Spindle (spike) files should not be used.
16. Before using office machines, be sure they are properly located and not in danger of falling.
17. Never clean or lubricate electrical appliances when they are in operation. When cleaning electrical appliances which are controlled by a switch on the machine, be sure the switch is

turned off and the plug removed.

18. Protection should be provided against moving parts on addressograph, bookkeeping, tabulating machines, and other types of power-driven office equipment.
19. Personnel shall not put broken glass in wastebaskets. If a tumbler or other piece of glassware has been broken, it is suggested that this material be packed in heavy paper, marked "broken glass" and placed alongside the wastebasket at the end of the day so that the person removing waste paper will not be cut accidentally.
20. Distorted or damaged metal or wire baskets should be repaired or replaced promptly, since sharp edges and points can cause injury.
21. Small ladders and stands used in some offices shall be equipped with threads of nonslip material and safety feet.
22. Ladders having broken or split side rails or steps shall be immediately taken out of service.

RULES FOR BUILDINGS

ADMINISTRATIVE RESPONSIBILITY FOR BUILDINGS

The responsibility for the safe condition of all buildings and equipment therein rests with the department(s) occupying the building. However, the Loss Control Committee may be called upon at any time for assistance.

BUILDING INSPECTIONS

Occupants of buildings shall make periodic inspections to keep hazards at a minimum in all area, covering such items as:

1. Good housekeeping.
2. Condition of stair treads, floor tiles, and carpeting for tripping hazards.
3. Exposed floor electrical and telephone outlets for tripping hazards.
4. Loose stairway railings.
5. Windows for cracked glass.
6. Walls and door frames for protrusions.
7. Office furniture and machines in need of repair.
8. Proper storage of materials.
9. Adequate lighting and ventilation.
10. Insects and other pests.
11. Locks on security doors.

Departments should document the location and description of all discrepancies noted and submit

requests for correction to the proper authority.

CORRIDORS AND AISLES

1. Corridors.
 - a. Corridors shall have a clear height of not less than 7 feet measured to the lowest projection from the ceiling.
2. Aisles.
 - a. Every portion of every building in which there are seats, tables, equipment or similar materials installed, shall be provided with aisles leading to an exit.
 - b. Where aisles are required, machinery equipment, parts and stocks shall be so arranged and spaced as to provide not less than 6 feet 8 inches headroom to a safe means of egress from the building. In existing installations, which do not comply with the minimum headroom clearance and is impractical to correct, suitable warning sign shall be placed near or on the obstruction or padded

DOORS

1. When fully opened, exit shall not obstruct the exit width or impede the flow of traffic from any other routine.
2. Every required exit doorway shall be of a size as determined by NFPA standards for occupancy of the building.
3. A latch or other fastening device on a door shall be provided with a knob, handle, panic bar, or other simple type of releasing device, the method of operation of which is obvious even in darkness.
4. A door designed to be kept normally closed as a means of egress, such as a door to a stair enclosure or stairwell, shall be provided with a reliable self-enclosing mechanism, and shall not at any time be secured in the open position. Signs should be posted on such doors.
5. When a door is required to be equipped with panic hardware, the panic hardware shall cause the door latch to release when sufficient force is applied to the releasing devices in the direction of exit travel. No lock, padlock, hasp, bar, chain, or other device, or combination thereof shall be installed or maintained at any time or in connection with any door on which panic hardware is required if such device prevents or is intended to prevent, the free use of the door for purpose of egress.
6. Doors swinging both ways, located between rooms such as kitchen and dining rooms shall be provided with view areas. One view area shall be provided for each door of swinging double doors.
7. No turnstile or similar device to restrict travel to one direction, or to collect fares or admission charges, shall be so placed as to obstruct any required means of egress.

ELEVATORS

1. In each elevator there shall be posted a card or plate indicating the safe carrying capacity. The safe capacity for passenger elevators shall be expressed in terms of the maximum number of passengers and for freight elevators in terms of the number of pounds. The rated capacity shall never be exceeded.
2. Self-service elevators shall have operating instructions and emergency procedures clearly outlined and posted inside the car.
3. Passenger shall guard against tripping when entering or leaving an elevator. No one shall get on or off an elevator while it is in motion.
4. Passengers shall not use freight elevators unless they are authorized for passenger use. Elevators not authorized for passenger use shall carry signs to that effect.
5. Passenger elevators and automatic operation freight elevators shall be provided with an emergency alarm system, operable from within the car which will provide effective means for summoning assistance at all hours in case of emergency.
6. Exposed gears, sprockets, tape or rope sheaves or drums of selectors, floor controllers or signal machines and the ropes, chains, or tapes for driving same, in machine rooms and secondary machinery spaces, shall be guarded to protect against accidental contact.

EXITS

1. Every building or usable portion thereof shall have at least one exit, and shall not have less than two exits where required.
2. When more than one exit is required from a building, at least two of the exits shall be remote from each other and so arranged and constructed as to minimize any possibility that both may be blocked by any one fire or other emergency condition.
3. Exits shall be so located and arranged that they are readily accessible at all times.
4. Exits from a room may open into adjoining or intervening room or area provided such adjoining room is accessible to the area served and provides direct access to an exit.
5. All exits shall discharge directly to the street, or to a yard, court, or other open space that gives safe access to a public way.
6. No obstruction or storage shall be placed in the required width of an exit.
7. At every required exit doorway, and whenever otherwise required to indicate clearly the direction of egress, an exit sign shall be provided.

8. Every required sign designating an exit or way of exit shall be so located and of such size, color and design as to be readily visible. No decorations, furnishings, or equipment which impair visibility of an exit sign shall be permitted.
9. Every sign shall be suitably illuminated by a reliable light source and maintained on a separate circuit or separate source of power.

GUARDRAILS

1. Guardrails shall be provided on all open sides of unenclosed roof openings, open landings, balconies or porches, platforms, runways, ramps or working levels more than 30 inches above the floor, ground or other working area. Wherever guardrail protection is required state or federal standards will be applied.
2. A guardrail shall consist of top rail, midrail or equivalent protection, and posts and shall have a vertical height within the range of 42 inches to 45 inches from the upper surface of the top rail to the floor, platform, runway or ramp level. Such rails shall be so constructed to withstand a force of 200 lbs. applied downward or horizontally at any point.

PLACES OF ASSEMBLY

1. Every place of assembly shall maintain aisles and/or corridors in accordance with the provisions of this chapter, "Corridors and Aisles."
2. Where smoking is permitted, there shall be provided proper ashtrays and at other convenient places approved noncombustible ashtrays or match receivers should be provided.
3. Fire extinguishers and/or fire hoses shall be visible and accessible at all times.
4. No person shall permit overcrowding or admittance of any person beyond the approved capacity of any place of public assemblage.
5. No person shall cause or permit any open flame to be used in any place of public assembly except when used in conjunction with approved heating or cooking appliances, or with special approval from the Fire Marshal.

STAIRWAYS

Every stairway or ramp serving any building or portion thereof shall conform to the requirements as set forth in NFPA and other state or federal standards.

WORK SPACE ACCESS

1. Every permanent elevated location, where there is machinery, equipment, or material which is customarily operated, adjusted, or otherwise handled shall be provided with a safe platform or maintenance runway. Access shall be by means of either fixed ladders or permanent ramps or stairways.
2. Every equipment room should have an opening large enough for an individual to exit at the opposite side from the door.

SAFETY RULES FOR WORK SURFACES

FLOORS

1. All working surfaces such as floors and corridor type areas shall be kept in good repair so that they may be kept clean and orderly. Grease, water or other slippery substance shall not be allowed to accumulate. It should be cleaned up at once.
2. Tripping hazards are a major source of falls and therefore floors and other walking surfaces are to be kept as clear and unobstructed as possible.
3. Cords must not cross aisles or work areas floor space without approved type ramps or other protection which eliminates the trip hazard.
4. Mats and gratings or other nonslip materials shall be used in wet process areas and other locations where drainage is necessary.
5. Highly polished floors may present slipping hazards. To minimize this danger, wax that is applied on it should be an approved water emulsion wax of the nonslip type and applied in accordance with applicable instructions.
6. Carpeting shall be laid smoothly, and loose or torn floor covering shall be promptly repaired, replaced, or removed. Rugs not securely fastened to the floor shall have a rubberized nonslip backing or shall be laid over pads made of rubber or other slip-resistant material.
7. Permanent roadways, walkways and material storage areas in outside yards shall be maintained free of dangerous depressions, obstructions and debris.

FLOOR OPENINGS

1. Floor openings and floor holes into which a person can accidentally walk, shall be guarded by either a standard railing on all exposed sides or a floor hole cover of standard strength hinged in place. When cover is not in place, it shall be protected by a removable standard railing.

2. Floor opening covers should be made of solid construction, but where there is not exposure to falling materials, grill or slatted covers with opening not over 1 inch in width may be used. Covers should be on nonslip surfaces and set flush. They shall not project more than 1 inch above the floor level.
3. Unused portions of service pits shall be either covered or protected by guardrails. This may be accomplished by moveable posts and chain rails or other guardrails which will provide equivalent protection.

LADDERS

1. Straight ladders, step ladders, library type ladders, safety stools, and other climbing equipment must be made available as necessary and be maintained in a safe condition. Personnel must be permitted to climb onto cabinets and other furnishings to reach elevated storage items or to work with racks or equipment installed above benches.
2. Ladders shall be maintained in good condition at all times. Ladders that are broken, weak or missing rungs shall not be used. If such ladders are not repaired promptly, they shall be removed from the job.
3. Ladders shall not be loaded in excess of the safe capacity for which they were constructed. Long ladders shall be braced to prevent undue deflection.
4. Portable ladders shall be erected at a pitch of 75-1/2 degrees for a maximum balance and strength. A simple rule for setting up a ladder at the proper angle is to place the base a distance from the vertical support equal to 1/4 of the working length (the length along the ladder between the foot and top support) of the ladder.
5. Unless suitable handholds are provided, the side rails of all ladders used to serve as a platform shall extend at least 3 feet above the upper landing.
6. Ladders, other than stepladders, shall be secured against displacement. The following ways are suggested:
 - a. By fastening the feet rigidly to the floor.
 - b. By lashing or fastening the ladder at the top.
 - c. By installing safety shoes.
7. Ladders shall not be painted in such a manner as to hide the grain structure of defects. Ladders may be kept coated with a suitable transparent preservative material.
8. The lashing of ladders together to increase the length of the ladder is prohibited.

9. Portable metal ladders shall not be used in the vicinity of electrical circuits in places where they may come in contact with them. Portable metal ladders shall be legibly marked with signs reading "CAUTION" - Do Not Use Around Electrical Equipment", or equivalent wording.
10. No one shall be permitted to stand and work on the top 3 rungs or cleats of a ladder unless there are members of the structure that provide a firm handhold or the worker is protected by a safety belt.
11. Ladders shall not be placed in passageways, doorways, driveways or any location where they may be displaced by activities being conducted on any other work, unless protected by barricades or guards.
12. Ladders should be stored in such a manner as to provide ease of access and to prevent danger of accident when withdrawing a ladder for use.

Wood ladders, when not in use, should be stored at a location where they will not be exposed to the elements, but where there is good ventilation.

Ladders stored in a horizontal position should be supported at a sufficient number of points to avoid sagging and permanent set.

13. On stepladders, these rules apply:
 - a. Stepladders longer than 20 feet shall not be supplied.
 - b. A uniform step spacing shall be employed which shall be not more than 12 inches.
 - c. A metal spreader or locking device of sufficient size and strength to securely hold the front and back sections in open positions shall be a component of each stepladder.
14. When ascending or descending, the user should face the ladder.
15. Ladders shall be inspected frequently and those which have developed defects shall be withdrawn from service for repair or destruction and tagged or marked as "Dangerous, Do Not Use."

RULES FOR ELECTRICAL SAFETY

GENERAL

1. The following table is helpful in understanding that a very small amount of electrical current is hazardous:

CURRENT IN MILLIAMPERES	EFFECT
2 ma a-c or 10 ma d-c	Threshold of sensation: A strong tingling.
10 ma a-c or 60 ma d-c	Let go current, above which one freezes due to muscular contraction
100 ma a-c or 500 ma d-c	Death due to heart fibrillation and paralysis of breathing

The current passing through the body is the key factor in any shock accident. Most of the over 1,000 electric shock fatalities which occur in the U.S. every year are due to voltages of less than 440 volts. It is imperative that respect be given all electrical equipment and circuits and that adequate precautions be taken regardless of voltage.

2. Listed below are some electrical safety precautions. Typical body resistances are on the order of 1,000 ohms. Keep your resistance high by keeping hands and feet dry. Shoes must be worn at work (rubber solid shoes are preferable.)

The removal of rings and watches is recommended. Persons should never hold an energized electric appliance with wet hands, or when wearing wet shoes. Do not touch electrical appliances when working at a sink. Know the location of all power plugs and off switches on all equipment. Assume all electronics gear is potentially lethal.

3. Report all shocks and defective equipment. A shock means something is wrong! The slightest shock when operating an electrical appliance in one location might, in another situation, result in instant death if part of the body made only slightly better contact with the ground or a grounded metallic object.
4. Rely on qualified electricians to do repairs.
5. In case of an accident:
 - a. Break connections to victim by turning off the power or use a non-conducting object to separate victim and source.

- b. Begin artificial respiration as quickly as possible. External cardiac massage may also be helpful.
- c. Obtain emergency assistance quickly by calling 911.
- d. When an electrical fire occurs, use CO₂ or all purpose dry chemical extinguishers only.

DISCONNECTING, MEANS OF

- 1. All switches, circuit breakers, fuses and other control and protective devices shall be so located or arranged that they may be safely operated, removed or repaired.
- 2. Each disconnecting means for motors and appliances and each service, feeder or branch circuit at the point where it originates shall be legibly marked to indicate its purpose unless located and arranged so the purpose is evident. The marking shall be of sufficient durability to withstand the environment involved.
- 3. Devices intended to break circuit shall have an interrupting capacity sufficient for the voltage employed and for the current that must be interrupted.

FLEXIBLE CORDS

- 1. Flexible cords shall be used only for : (a) pendants, (b) wiring of fixtures, (c) connection of portable lamps or appliances, (d) elevator cables, (e) wiring of cranes and hoists, (f) connection of stationary equipment to facilitate their frequent interchange, (g) prevention of the transmission of noise or vibration, (h) fixed or stationary appliances where the fastening means and mechanical connections are designed to permit removal for maintenance and repair, (I) data processing cables.
- 2. Flexible cords shall not be used; (a) as a substitute for the fixed wiring of a structure (b) where run through holes in walls, ceilings, or floors, (c) where run through doorways, windows or similar openings, (d) where attached to building surfaces, (e) where concealed behind building walls, ceiling, or floors.
- 3. Flexible cords shall be used only in continuous lengths without splice or tape when initially installed. The repair of hard-service flexible cords No. 12 and larger shall be permitted if the completed splice retains the insulation, outer sheath properties, flexibility, and usage characteristics of the cord being spliced.
- 4. Flexible cords shall be so connected to devices and to fittings that tension will not be transmitted to joints or terminal screws. This shall be accomplished by a knot in the cord, winding with tape, by a special fitting designed for that purpose, or by other approved means which will prevent a pull on the cord from being directly transmitted to the joints or terminal screws.

GROUND-FAULT CIRCUIT PROTECTION

1. To protect employees using portable electrical equipment in outdoors, wet, or other hazardous locations; ground-fault circuit interrupters (GFCI) shall be used at all times when these conditions exist.
2. All 120-volt, AC, single phase, 15 and 20-ampere receptacle outlets in outdoor, wet, or other hazardous locations, shall have approved ground-fault circuit interrupters.

GROUNDING EQUIPMENT CONNECTED BY CORD AND PLUG

1. Under any of the conditions described in (a) through (e) below, exposed non-current-carrying metal parts of cord-and plug-connected equipment likely to become energized, shall be grounded.
 - a. In hazardous locations (flammable liquids and gases present).
 - b. Where operated at over 150 volts to ground.

Exception No. 1

Motors, where guarded.

Exception No. 2

Metal frames of electrically heated appliances.

- c. Potentially hazardous portable, hand-held, motor-operated tools and appliances such as drills, wet scrubbers, sanders, and saws.
- d. Cord and plug-connected appliances used in damp or wet locations or by persons standing on the ground or on metal floors or working inside of metal tanks, or boilers.
- e. Portable tools likely to be used in wet and conductive locations.

Exception No. 1

Portable tools or lighting likely to be used in wet and conductive locations shall not be required to be grounded where supplied through an isolating transformer with an ungrounded secondary of not over 50 volts.

Exception No. 2

Listed portable tools and appliances protected by an approved system of double insulation, or its

equivalent, shall not be required to be grounded.
Where such a system is employed, the equipment shall be distinctly marked.

GROUNDING FIXED EQUIPMENT

1. Exposed noncurrent-carrying metal parts of fixed equipment likely to become energized under abnormal conditions shall be grounded when they are:
 - a. Within 8 feet vertically or 5 feet horizontally of ground or grounded metal objects and subject to contact by persons.
 - b. Located in a hazardous location.
 - c. In a hazardous location.
 - d. Supplied by a metal-clad, metal sheathed, or metal-raceway wiring method.
 - e. Operated with any terminal at over 150 volts to ground.

Exception No. 1

Enclosures for switches or circuit breakers used for other than service equipment and accessible to qualified persons only.

Exception No. 2

Metal frames of electricity heated devices, exempted by special permission, in which case the frames shall be permanently and effectively insulated from ground.

2. Exposed, non/current-carrying metal parts of the kinds of equipment described in (a) through (e) below, regardless of voltage shall be grounded:
 - a. Switchboard frames and structures supporting switching equipment.

Exception:
Frames of DC, single-polarity switchboards where effectively insulated.
 - b. Generator and motor frames in an electrically operated organ.

Exception:
Where the generator is effectively insulated from ground and from the motor driving it.
 - c. Motor frames.

- d. Enclosures for motor controllers.
Exception:
Lined covers of snap switches.
- e. Electric equipment for elevators and cranes.

Grounding of Live Parts

1. Live parts of electric equipment operating at 50 volts or more shall be guarded against accidental contact by approved cabinets or other forms of approved enclosures or by:
 - a. location in a room, vault, or similar enclosure that is accessible only to qualified persons.
 - b. suitable permanent, substantial partitions or screens so arranged that only qualified persons will have access to the space within reach of the live parts.
 - c. location on a suitable balcony, gallery, or platform so elevated and arranged as to exclude unqualified persons.
2. Entrances to rooms and other guarded locations containing exposed live parts shall be marked with conspicuous warning signs forbidding unqualified persons to enter.

Methods of Grounding

1. The grounding connection for metal noncurrent-carrying equipment shall be made on the supply side of the service disconnecting means.
2. The path to ground from circuits, equipment and conductor enclosures shall:
 - a. Be permanent and continuous.
 - b. Have ample carrying capacity to conduct safely any currents liable to be imposed on it.
 - c. Have impedance sufficiently low to limit the potential above ground and to facilitate the operation of the overcurrent devices in the circuit.
3. Metal noncurrent-carrying fixed equipment where required to be grounded shall be grounded by an equipment grounding conductor contained within the same raceway, cable or cord or otherwise run with the circuit conductors. The conductor cover shall have a continuous outer finish that is either green, or green with one or more yellow stripes.

Exception:

An insulated grounding conductor larger than No. 6 shall, at the time of insulation be permitted to be suitably identified as a grounding conductor at each end and at

every point where the conductor is accessible.

4. Noncurrent-carrying metal parts of cord- and plug- connected equipment (portable), where required to be grounded, shall be grounded by one of the methods indicated in (a), (b) or (c) below:
 - a. Use of a metal plat on the conductors supplying such equipment if grounding contact is used for grounding the metal enclosure. The attachment plug should be secured to the metal plate and to equipment by connectors that are approved for the purpose.
 - b. Use of a grounding conductor run with the power supply conductors in a cable assembly or flexible cord properly terminated in ground-type attachment plug with one fixed grounding contact. The covering shall have a continuous outer finish that is either green or green with one or more yellow stripes.
 - c. Use of a separate flexible wire or strap, insulated or bare, protected against physical damage.

OUTDOOR CONDUCTOR - CLEARANCES

1. For outside wiring all conductors shall comply with the clearances specified below:

	MINIMUM CLEARANCE Low-voltage 0-750 volts
Above and along thoroughfares	20 feet
Above areas where it is possible to drive vehicles	16 feet
Above areas accessible to pedestrians only	12 feet
Distance away from windows, doors, scaffolds, or similar locations shall be maintained not less than:	3 feet

WORK PROCEDURES

1. Only qualified persons shall work on energized equipment and/or wiring.
2. No employee shall work in such proximity to any part of an electric power circuit unless the employee is protected against electric shock by de-energizing the circuit and grounding it or by guarding it by effective insulation or other means.
3. Suitable protective equipment or devices shall be provided and used on or near energized equipment for the protection of employees where there is a recognized hazard of electrical shock or burns. In lieu of protective equipment, barricades may be used to provide protection from exposed energized equipment.
4. Equipment or circuits that are de-energized shall be rendered inoperative and have tags attached at all points where such equipment or circuits can be energized.
5. All reasonable means shall be provided to bar unauthorized persons and/or equipment from the immediate vicinity of the work in progress.

WORKING SPACE AROUND ELECTRICAL EQUIPMENT

1. Sufficient access and working space shall be provided and maintained around all electrical equipment to permit ready and safe operation and maintenance of such equipment.
2. The dimension of the working space in the direction of access to live parts operating at 600 volts or less which require examination, adjustment, servicing or maintenance while alive, shall not be less than indicated in the Table. In addition to the dimensions shown in the Table, the work space shall not be less than 30 inches wide in front of the electric equipment. Distances shall be measured from the live parts if such are exposed or from the enclosures front or opening if such are enclosed. Concrete, brick or tile walls shall be considered as grounded.

WORKING CLEARANCES

Voltage to Ground	Minimum Clear Distance (feet) *Condition:		
	a	b	c
	2 ½	3	
	2 ½	3 ½	4

*Conditions:

- a. Exposed live parts on one side and no live or grounded parts on the other side of the working space.

- b. Exposed live parts on one side and grounded parts on the other side.
 - c. Exposed live parts on both sides of the work space.
3. Working space required by this Section shall not be used for storage.

 4. At least one entrance of sufficient area shall be provided to access to the working space around electrical equipment.
 5. Adequate illumination shall be provided for all working spaces around electrical equipment. The light outlets shall be so arranged that persons changing lamps or making repairs on the lighting system will not be endangered by live parts or other equipment.
 6. The minimum headroom of working spaces about switchboards, panel boards and control centers which require manual operation or where there are live parts exposed at any time shall be 6-1/4 feet.

ENVIROMENTAL SAFETY RULES

ILLUMINATION

1. Illumination which is adequate and suitable to provide a reasonably safe environment shall be provided in all walking, working and service areas.
2. Good quality of lighting free of excessive glare, brightness, etc., shall be provided. There shall be good direction and uniform distribution of illumination. Checking for general quality requirements can usually be done by visual observation and without need of instrumentation.
3. There shall be a sufficient quantity of illumination in all working places. Determination as to the adequacy or quantity of illumination shall be made by use of a light meter.
4. The following are energy saving light levels that should be considered the minimum acceptable:
 - a. Offices and shops;

60 to 80 footcandles, depending upon need. Higher levels of light needed because of more difficult work should be achieved by supplementary sources such as desk lamps.
 - b. Hallways, stairs and public traffic areas:

10 footcandles is the recommended light level for all high traffic areas.

- c. Outdoor walkways:
0.5 to 1 footcandle is the minimum recommended light level for all parts of outdoor walkways and other public foot traffic areas.
 - d. Restrooms:
20 footcandles is the recommended light level.
 - e. Parking:
0.5 to 1 footcandle is the minimum recommended light level for all parking lot areas.
5. Where the quality of lighting cannot be obtained by general lighting methods, supplementary lighting meeting the following requirements should be provided.
- a. Supplementary lights should be permanently mounted in a location to produce the best lighting efforts.
 - b. The lights must be mechanically and electrically rigged to withstand possible rough handling.
 - c. Lamps should be guarded and of a type to withstand this service.
 - d. Guards or other means should protect the user from excessive heat.
 - e. All possible precautions should be taken to prevent electrical shock to the user.

NOISE CONTROL

1. Protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in Table A when measured on the A scale of a sound level meter at a slow response.
2. When employees are subjected to sound exceeding those listed in Table A, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of Table A personal protective equipment shall be provided.
3. In all cases where the sound levels exceed the values shown herein, a continuing, effective hearing conservation program shall be administered.

TABLE A
PERMISSIBLE NOISE EXPOSURES

Duration per day, hours	Sound level dBA slow response
8	90
6	92

4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

Noise exposures at different levels are combined by adding the fraction of allowable time used at each exposure. The sum of such fractions should not exceed unity. For example, if an exposure consisted of 1 hour at 100 dBA (allowable 2 hours) and 3 hours at 90 dBA (allowable 8 hours) and 4 hours at less than 90 dBA (no limit) the sum of the fractions of the allowable time used would be $\frac{1}{2} + \frac{3}{8} + 0 = \frac{7}{8}$. Since this is less than 1, the allowable exposure is not exceeded.

4. Exposure to impulsive or impact noise should not exceed 140 dBA peak sound pressure level.
5. Standards for nuisance noise levels do not exist. However, the Table below is a guide to desirable noise levels within classrooms, conference rooms, and private office.

TABLE B

Description	dBA
Very quiet	0-38
Quiet	38-50
Moderately noisy (At 58 dBA, it takes a slightly raised voice to be heard at 3 feet and efficiency may just begin to be reduced.)	50-63
Noisy (At 78 dBA, telephone use becomes difficult.)	63-75
Very Noisy (At 78 dBA, telephone use is unsatisfactory.)	75-88
Intolerably noisy	Above 88

6. Engineering controls such as enclosures and partitions are the recommended method of noise control. Personal protective equipment such as ear plugs and special ear muffs which screen out harmful sound while allowing conversational tones to be heard can only be used on a temporary basis or when engineering methods do not work. Another consideration is an effort must always be made to limit the time spent in noisy environment.
7. Departments should keep noise levels as low as possible and seek the advice of the Loss Control Committee on all questions regarding noise.

FIRE PROTECTIONS RULES

GENERAL

1. All fires, regardless of how minor or if burned out prior to discovery, shall be reported wither orally or in writing to the Loss Control Committee. As in the case of accidents and injuries, the information derived from these reports will materially assist in identifying those areas and conditions which are particularly fire hazardous. The reports will be analyzed and, if possible, corrective actions to eliminate the hazard will be taken immediately.
2. All drapes, curtains, drops, and other similar material, including Christmas trees, located in corridors, stairways, lobbies, passageways and balconies used as required exits that would tend to increase the fire and panic hazard shall be made from a non-flammable material, or shall be treated and maintained in a flame-retardant condition by means of a flame-retardant solution or process approved by the Fire Marshal. In addition, exit lights, fire alarms, wet standpipe hose cabinets, and fire extinguisher locations shall not be concealed by any decorative material.

FIRE ALARMS

1. Manual fire alarm stations shall be used only for emergency or signalling purposes.
2. Each station shall be securely mounted so that the bottom of the station is not less than 4 ½ feet and not more than six feet above the floor level.
3. Manual fire alarm stations shall be distributed throughout buildings so that they are unobstructed, readily accessible, and located in the normal path of exit from an area.
4. The audible signal shall be of sufficient duration and intensity that it is capable of being heard by persons of average hearing ability at all locations inside the affected building.
5. All alarm systems shall be under the supervision of qualified persons. These persons shall cause proper tests and inspections to be made at regular intervals and shall have general charge of all alterations and additions to the systems under this supervision.

FIRE EXTINGUISHERS

Portable fire extinguishers are designed to cope with fires of limited size and are necessary even though the property is equipped with automatic sprinklers, standpipe and hose, or other fixed equipment.

1. Portable extinguishers shall be maintained in a fully charged and operable condition, and keep in their designated places at all times when they are not being used.
2. Extinguishers shall be conspicuously located where they will be readily accessible and immediately available in the event of fire. They shall be located along normal paths of travel including exits from an area.
3. Extinguishers shall not be obstructed from view. In large rooms, and in certain locations where visual obstructions cannot be completely avoided, conspicuous means shall be provided to indicate the location and intended use of extinguishers.
4. Extinguishers shall be installed on the hangers or in the brackets supplied, mounted in cabinets, or set on shelves unless the extinguishers are of the wheeled type.
5. Extinguishers mounted in cabinets or wall recesses or set on shelves shall be placed in a manner such that the extinguisher operating instructions face outward.
6. Fire extinguishers shall be provided for the protections of the building structure, the occupancy hazards contained therein, and for the protections of life.
7. Minimal sizes and number of fire extinguishers for flammable liquids (Class B) and energized electrical equipment (Class C) shall be provided on the basis of NFPA requirements.
8. Extinguishers shall be inspected to ensure they are in their designated places, to ensure they have not been actuated or tampered with, and to detect any obvious physical damage, corrosion, or other impairments.
9. Extinguishers removed from the premises to be recharged shall be replaced by spare extinguishers during the period they are gone.

SPECIAL FIRE EXTINGUISHING SYSTEMS

1. Where there is a possibility that personnel may be exposed to a carbon dioxide, dry chemical, or other specialized discharge, suitable safeguards shall be provided to ensure prompt evacuation and to prevent entry into such atmospheres, and also to provide means for prompt

rescue of any trapped personnel. Such safety items as personnel training, warning signs, discharge alarms, predischage alarms and respiratory protection shall be considered.

2. Total flooding systems shall be designed, installed, tested and maintained in accordance with the applicable NFPA codes.

3. These systems shall be maintained in full operating condition at all times.

4. All specialized extinguishing systems including alarms, shutdown, and other associated equipment shall be thoroughly inspected and checked for proper operation by a licensed competent inspector.

SPRINKLER SYSTEMS

1. Every high hazard occupancy shall have automatic sprinkler protection or such other protection as may be appropriate to the particular hazard, including explosion venting designed to minimize danger to occupants in case of fire or other emergency before they have time to utilize exits to escape.
2. Before shutting off a section of the fire sprinkler system to make system connections, notify the Loss Control Coordinator. Additional protection may have to be required.
3. Sprinklers which are so located as to be subject to mechanical injury (in either the upright or the pendent position) shall be protected with approved guards.
4. Sprinklers shall not be painted and any sprinklers which have been painted, except for factory applied coatings applied for identification of temperature ratings shall be replaced with new approved sprinklers.
5. Water flow alarms shall be provided on all sprinkler installations. All systems should be equipped with either alarms to outdoor locations or to central control panels.
6. Clearance of at least 36 inches shall be maintained between sprinkler deflectors and top of storage to reduce possibility of obstruction to the distribution of water.
7. In order to ensure proper operation of the automatic sprinkler systems, each system is to be tested on a periodic basis at times that will cause the least disruption of normal activity.

STANDPIPES, HOSES AND HYDRANTS

1. Hose outlets shall be within easy reach of a person standing on the floor and in no case should be over six feet from the floor. Hose stations shall be located conspicuously within the immediate area and where they are not likely to be obstructed. In buildings divided by numerous partitions, standpipes should be so located that the streams can be brought to bear in any room.
2. Each hose outlet provided for the use of building occupants shall be equipped with not more than 75 feet of approved small fire hose attached and ready for use.
3. Nozzles shall be attached to each hose.
4. A hose valve shall be provided at each standpipe outlet for attachment of hose.
5. Inspections shall be made frequently to assure that hoses are in proper position on racks, and the standpipe system and fire hydrants are in good operating condition.

VENTING EXPLOSIONS

1. Vents are required in building areas containing operations where flammable gases, vapors, or mists, may be present in explosive concentrations in the air.
2. Highly hazardous operations should be separated into individual units by pressure resisting walls, and each unit so formed should be vented to the outside of the building.
3. When venting a room, building, or piece of equipment, consideration must be given to the location into which an explosion is to be vented.

RULES FOR THE STORAGE AND HANDLING OF FLAMMABLE LIQUIDS AND MATERIALS

GENERAL

1. Limit the quantities at any one location to those actually necessary, but not to exceed the limit specified below.
2. Prohibit smoking and eliminate other possible ignition sources wherever flammable liquids are stored or used.
3. Avoid sparks from static charges generated by pouring; connect dispensing and receiving containers (if metal) by a suitable electrical conductor.
4. Provide fire barriers, fire alarms and fire equipment, as appropriate, at all locations of storage and use.

5. Prevent accumulation of vapors by handling and by providing adequate ventilation.
6. Use only approved containers, e.g., safety cans (*) or metal drums, for all transportation and handling.
7. Label every container used for flammable liquids with the name of the material and the words "Danger- Flammable-Keep away from heat, sparks, and open flames - Keep closed when not in use.

CLASSIFICATION AND HANDLING RESTRICTIONS

<u>Classification Code</u>	IA
Flash points	Less than 73 deg.F
Boiling points	Less than 100 deg.F
Flammability	
Hazard	Extremely High

<u>Classification Code</u>	IB
Flash points	Less than 73 deg. F
Boiling points	Greater than 100 deg.F
Flammability	
Hazard	Very High

<u>Classification Code</u>	IC
Flash points	73 deg.F - 100 deg.F
Boiling points	---
Flammability	
Hazard	High

<u>Classification Code</u>	II
Flash points	100 deg.F - 140 deg.F
Boiling points	---
Flammability	
Hazard	Moderate

<u>Maximum Container Size</u>	IA
Glass Containers	1 pint
Metal cans	5 gallons
Safety cans (*)	5 gallons
Metal cans	60 gallons

<u>Maximum Container Size</u>	IB
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Glass Containers	1 quart
Metal cans	5 gallons
Safety cans (*)	5 gallons
Metal cans	60 gallons

<u>Maximum Container Size</u>	IC
Glass Containers	1 gallon
Metal cans	5 gallons
Safety cans (*)	5 gallons
Metal cans	60 gallons

Maximum Quantities at any location

(Isolated, special purpose bldg.)

IA	1,100 gallons
IB	2,200 gallons
IC	4,400 gallons
II	8,800 gallons

- a. Special storage rooms (***) with automatic extinguishers: all classifications - 5 gal./sq. f but not to exceed 750 gallons.
- b. Special storage rooms (***) without automatic extinguishers: all classifications - 2 gal.\sq.ft. But not to exceed 300 gallons.
- c. Offices and other areas of use not in safety cans: all classifications - 25 gallons
- d. Offices and other areas of use in approved safety cans (*) : all classifications - 60 gallons
- e. Offices and other areas of use in approved safety cabinets (**): all classifications - 60 gallons

* Safety cans must be equipped with automatic closure for evaporation control and overpressure reliefs; they must be equipped with flame arrestors and Teflon gaskets at all openings.

** Safety cabinets must be double wall steel construction with three-point locking door, and a two-inch still at the bottom of the door. Label: "Flammable - Keep Fire Away."

*** Inside storage room must have approved self-closing fire doors, liquid-tight seal where walls join the floor, a four-inch still or equivalent stump with drain to a safe location; gravity or mechanical ventilation system shall provide at least six complete changes of air per hour.

VAPORS, FLAMMABLE

1. Ventilation shall be sufficient so that under normal operating conditions concentrations of flammable vapors or gases in buildings, rooms or similarly enclosed places shall not exceed 20 percent of the lower explosive limit for such vapors.
2. No source of ignition, shall be permitted in any location, indoors or outdoors, where the concentration of the flammable gases or vapors exceeds or may reasonably be expected to

exceed 20 percent of the lower explosive limit in the working atmosphere. Tests shall be made to ascertain that this limit is not to be exceeded before a source of ignition is introduced into such location, and such tests shall be repeated frequently.

3. Smoking is forbidden in any location where flammable vapor is present.

COMPRESSED GAS

1. Cylinders shall be stored in well-protected, well-ventilated, dry ; location, at least 20 feet from highly combustible materials such as oil or grease.
2. Cylinders may be stored in the open, but in such cases, protection is needed against the weather, from the dampness of the ground, and should be shaded against the direct rays of the sun. Bulk storage is to be in approved rooms or outside enclosures. Bulk storage cylinders should be chained and security measures taken to prevent tampering and loss.
3. Do not store empty cylinders with the full ones, and do not place cylinders where they may become part of an electrical circuit.
4. All gas cylinders in service or storage, empty or full, shall be securely held upright in substantial racks or secured to other rigid structures so that they will not fall or be knocked over. During storage, cylinder caps should be in place.
5. All cylinders are to be considered full unless properly identified as empty. Empty cylinders should be returned to the supplier and not be permitted to accumulate. To prevent contamination and even explosive mixtures in cylinders, always leave at least 25 psig minimum pressure in all "empty" cylinders. Do not leave an empty cylinder attached to a pressurized system.
6. Gas cylinders in portable service shall be legibly marked, for the purpose of identifying the gas content, with either the chemical or the trade name of the gas. Such marking shall be by means of labeling, and shall not be readily removable. The marking shall be located on the shoulder of the cylinder.
8. Cylinders should not be accepted unless the cylinder contents are clearly labeled. Do not accept cylinders which are damaged or do not have a valve protection cap.
9. Oxygen cylinders shall never be stored near highly combustible materials, or other fuel gas cylinders, nor near any other substances likely to cause or accelerate fire. Systems used for

other gases must never be used for oxygen.

10. No attempt shall ever be made to transfer gases from one cylinder to another, to refill cylinders, or to mix gases in a cylinder.

11. Never force a gas cylinder valve. If the valve cannot be opened by the wheel or small wrench provided, the cylinder should be returned.

12. Use Compressed Gas Association (CGA) approved fittings and components.

13. Each department head shall determine that compressed gas cylinders under his control are in a safe condition to the extent that this can be determined by visual and other inspection. Cylinders with distinct visual bulge shall be removed from service until the nature of the defect is determined.

14. Compressed gas cylinders shall have pressure relief devices installed and maintained in accordance with requirements of the Compressed Gas Association. Types of safety relief devices are as follows:

15. Piping used with compressed gasses shall be steel, wrought iron, brass or copper pipe, or seamless copper brass or stainless steel tubing. Piping systems shall be protected by pressure relief devices set to function at not more than the design pressure of the systems and discharging upwards to a safe location.

SAFETY RULES FOR MACHINERY AND MACHINE GUARDING

GENERAL

1. Machine guarding shall be provided to protect the operator and other persons in the machine area from injury as a result of coming in contact with the work in progress, and/or moving parts of the mechanical motions of the machines.

2. Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself.

3. The point of operation of machines whose operation exposes an employee to injury, shall be guarded.

4. The guarding device shall be in conformity with appropriate standards, or be so designed as to prevent the operator from having any part of his body in the danger zone during the operating cycle.
5. Distinct from guarding at the point of operation but complementary to it is the matter of guarding moving parts of equipment used in the mechanical transmission of power. These mechanisms include shafting, belts, pulleys, gears, etc.
6. There shall be conspicuously displayed at all machines driven by electric motors that are controlled by fully automatic starters and which may injure employees, permanent signs giving warning that the machines are automatically controlled and may start at any time.

ABRASIVE WHEELS

1. Abrasive wheels shall be used only on machines provided with safety guards.
2. Such safety guards shall be hoods of such design and construction as to effectively protect the employee from flying fragments of a bursting wheel insofar as the operation will permit.
3. The hood guard shall cover the spindle end, nut, and flange projections. The safety guard shall be mounted so as to maintain proper alignment with the wheel, and the strength of the fastenings shall exceed the strength of the guard.
4. On offhand grinding machines, work rests shall be used to support the work. They shall be of rigid construction and kept adjusted closely to the wheel with a maximum opening of one-eighth inch to prevent the work from being jammed between the wheel and the rest.
5. An adjustable tongue-guard shall be installed at the top end of the hood guard and clearance to the wheel periphery shall not exceed one-fourth inch.
6. The maximum angular exposure of the grinding wheel periphery and sides for hoods used on machines known as bench and floor stands should not exceed 90 degrees or one-fourth of the periphery. This exposure shall begin at a point not more than 65 degrees above the horizontal plane of the wheel spindle.
7. Whenever the nature of the work requires contact with the wheel below the horizontal plane of the spindle, the exposure shall not exceed 125 degrees.
8. Immediately before mounting, all wheels shall be closely inspected and sounded by the user (ring test) to make sure they have not been damaged. The spindle speed of the machine shall be checked before mounting of the wheel to be certain that it does not exceed the maximum

operating speed marked on the wheel.

CLEANING, REPAIRING AND SERVICING

1. Machinery or equipment capable of movement shall be stopped and the power source locked off or disengaged to prevent inadvertent movement during cleaning, servicing or adjusting operations. Solvents with a flash point of 100 degrees F or below shall not be used for cleaning parts and equipment. Gasoline, naphtha, toluene, and Varsol are but a few of the flammable liquids in this category. Kerosene with a flash point of 130 degrees F now contains an additive that is harmful to the skin and caution should be additive that is harmful to the skin and caution should be exercised in its use. Appropriate gloves shall be worn.
2. Every power driven machine equipment with lockable controls or readily adaptable to lockable controls shall be locked out or positively sealed in the "off" position during repair work. Machines not equipped with lockable controls shall be considered in compliance with this order when positive means are taken, such as deenergizing or disconnecting the equipment from its source of power, or other action which will prevent the machine from inadvertent movement.
3. A sufficient number of accident prevention signs or tags and padlocks or other similarly effective means shall be provided and used. Signs, tags or padlocks, shall have means by which they can be readily secured to the controls.
4. If the machinery or equipment must be capable of movement during this period in order to perform the specific tasks, the employees shall minimize the hazard of movement by the use of extension tools (e.g. extended swabs, brushes, scrapers) or other methods or means. Employees shall be made familiar with the safe use and maintenance of such tools by thorough training.

MACHINES, MISCELLANEOUS

1. When the periphery of the blades of a fan are less than seven (7) feet above the ground, floor or working level the blades shall be guarded. The guard shall have openings no larger than one-half (½) inch.

2. Each washing machine and dryer shall be equipped with an interlocking device that will prevent the inside cylinder from moving when the outer door on the case or shell is open, and will also prevent the door from being opened while the inside cylinder is in motion.
3. The in-running sides of power operated rollers or cylinders on printing type presses shall be provided with a guard so arranged that the material can be fed to the rollers without permitting the operator's fingers to be caught between the rollers or cylinders.
4. Power-driven Guillotine Paper Cutters shall be provided with:
 - a. A non-repeat device that will automatically lock the clutch mechanism into place so that the cutter cannot make a second stroke until the hand lever is again moved into the starting position.
 - b. A starting device which requires the simultaneous action of both hands during the cutting motion of the knife.
 - c. Simultaneous operation of paper cutters by more than one operator shall not be permitted or required by the employer.
5. Hand powered paper cutters shall have a safety bar to prevent fingers holding paper from coming into contact with the blade. The blade shall also be adjusted so as to not fall when released.
6. Horizontal tilting type mixers shall be provided with a cover over the top of the mixer. All interlocking device shall be provided, so the power cannot be applied to the agitators unless the mixer is in operating position, with a cover in place. The mixer when tilted shall be operated with the cover open only if equipped with an electrical push button when operating the mixer with the cover open; the button shall be located so the operator cannot reach into the mixer while pressing the button.

METALWORKING EQUIPMENT

1. Metal lathe face plates and chucks should have no projection; or circular shields should be installed to prevent accidental contact with projections. Safety type lathe dogs, with no projecting set screws should be used. Splash guards should be provided to protect the operator and working area from cutting or cooling fluids thrown from the work. Pipe guards or other enclosures should be installed to prevent injury from stock projecting from turret lathes or automatic screw machines.
2. Milling machines should have a transplanted shield over the cutter that will prevent accidental contact with the cutter and serve also as a chip guard. Guards may be adjustable.
3. Drill presses should have the spindle enclosed as completely as possible. The chuck shall be tightened securely with the key provided. The key shall not be left in the chuck. The work shall be firmly clamped and a center punch used to score the material before the drilling operation is started. If the work should slip from the clamp, no attempt shall be made to stop

it with the hands.

4. Circular metal saws should be equipped with a hood guard which automatically adjusts to the thickness of the stock being cut.
5. Band saws shall have upper and lower wheels completely enclosed with sheet metal or heavy small-mesh screen. The portion of the saw blade between the upper saw guide and upper saw blade wheel shall be completely enclosed with a sliding fixture attached to the guide.
6. Mechanical power and foot and hand power squaring shears shall be provided with a guard which will prevent the hands of the operator from entering the zone traveled by the knives of the shears while they are in motion. This guard may be a fixed barrier, set not more than three-eighths inch above the table, or a self-adjusting barrier with a limit of three-eighths inch above the table, but that will automatically rise to the thickness of the materials.

Automatic clamps of "hold-downs" on squaring shears when cutouts are filled in with plastic or screen, will be acceptable as a guard. Hydraulic or pneumatic hold-downs shall be guarded by U shaped guards coming down to not less than three-eighths inch of the table or other equivalent method.

WOODWORKING EQUIPMENT

1. Circular hand-fed rip and cross-cut table saws shall be guarded by a hood which shall completely enclose that portion of the saw above the material being cut. The hood and mounting shall be arranged so that the hood will automatically adjust to the thickness of and remain in contact with the material being cut. All exposed parts of the saw blade under that table shall be guarded. Each hand-fed circular rip and cross-cut saw shall be furnished with a spreader. Each circular rip saw shall be provided with anti-kickback fingers or dogs.
2. A hood or guard shall be used that will cover a self-feed circular rip saw to at least the depth of the teeth. The hood or guard need not rest upon the table nor upon the material being cut, but shall extend to within one-half inch of the stock being worked. The feed rolls or star wheels shall be enclosed by a cover coming down to within one-half inch of the stock being worked. A spreader shall be provided except where a roller wheel is provided in back of the saw. Every self-feed circular rip saw shall be equipped with an anti-kickback device installed on the in-feed side.
3. Swing saw shall be provided with a hood that will completely enclose the upper half of the saw, the arbor ends, and the point of operation at all positions of the saw. Its hoods shall be so designed that it will automatically cover the lower portion of the blade, so that when the saw is returned to the back of the table or material being cut. Each saw shall be provided with an effective device to return the saw automatically to the back of the table when released at any point of its travel. Limit stops shall be provided to prevent the saw from swinging beyond the front or back edges of the table. A latch or equivalent device should be provided to catch and retain the saw at the rear of the table and to prevent its rebounding.
4. The upper hood of a radial saw shall completely enclose the upper portion of the blade down to a point that will include the end of the saw arbor. The sides of the lower exposed portion

of the blade will automatically adjust itself to the thickness of the stock and remain in contact with the stock being cut. When radial saws are used for ripping, a spreader and nonkickback fingers shall be forward travel of the blade beyond the front end of the table. There shall be a device which will return the saw automatically to the back of the table when released.

5. All portions of the saw blade shall be enclosed or guarded on band saws except the working portion of the blade between the bottom of the guide rolls and the table. The outside periphery of the enclosure shall be solid. The sides of the band wheels shall be either enclosed by solid material or wire mesh or perforated metal.
6. Jointers shall be equipped with cylindrical cutting heads. A suitable guard which will automatically adjust to cover the portion of the cutting head not protected by material in process shall be used. The exposed portion of the cutting head at the rear of the fence shall be covered and where knives are exposed beneath the table, they shall be guarded. A safety pusher device of suitable design shall be provided and used.
7. Knife heads of wood shapers and cutting heads of other machines not automatically fed, shall be guarded, or templates, jigs or fixtures which will enable the part to be processed without exposing the operator's hands to the danger zone shall be used. Double-spindle shapers shall be provided with a spindle starting and stopping device for each spindle. Single cutter knives shaper heads shall not be used. Knives shall balance each other by weight and shall be so mounted in the head as to revolve at full speed without dangerous vibration. Knife heads of woodworking machines which are automatically fed, such as stickers, planers, moulders, and matchers, when exposed to contact, shall be guarded. The feed rolls shall be enclosed, except that part as may be necessary to feed stock.
8. Sanding machines shall be guarded as below:
 - a. Feed rolls of self-feed machines shall be protected with a guard to prevent the hands of the operator from coming into contact with the in running rolls at any point.
 - b. Disk sanders shall have the exhaust hood or other guard so arranged as to enclose the revolving disk, except for portion of the disk above the table.
 - c. Belt sanders shall be provided with guards at each nip point where the sanding belt runs on a pulley. The unused run of the sanding belt shall be guarded against accidental contact.

RULES FOR SHOP SAFETY

1. Personnel shall not be permitted to operate any machinery until they have been instructed as to the hazards and the proper operation of such equipment and the use of protective devices.
2. All floors shall be kept in good repair and shall be free from protruding nails, splinters, holes, unevenness, and loose boards. Effective means shall be provided to prevent slipping.
3. Aisles shall be of sufficient width to permit the uncrowded and safe passing of personnel, trucks, or material. Where practicable lines shall be painted on the floor or some similar

method shall be employed to mark aisles.

4. During all working periods each working area, operation or process shall be adequately lighted and harmful glare minimized.
5. Tools, machines, devices or other equipment that are hazardous because of defects or other conditions shall not be used until suitably repaired.
6. Areas around machines should be kept clear of obstructions and in nonslippery condition. All spilled oil or grease shall be cleaned up immediately.
7. Do not clean chips from the surface of machines with compressed air or with hands; a brush or hood should be used. Where general cleaning of machines and equipment by compressed air is considered necessary, the outlet pressure shall be reduced to not more than 10 p.s.i. by means of a regulator or pressure reducing control nozzle designed for this purpose.
8. Cleaning of one's clothes with compressed air is prohibited.
9. When using portable electrical equipment around machine tools, keep all electrical cords clear of moving parts.
10. Do not place hand tools on machines. Keep them in their assigned location.
11. Loose, flowing or torn clothing, gloves, neckties, long sleeves and rings or bracelets shall not be worn around machinery such as band and circular saws, drill presses, grinders, jointers and planers, lathes and sanders. Sung-fitting clothing shall be worn.
12. Goggles or face shields shall be worn when grinding or when there is danger of flying particles.
13. Gloves are not to be worn around rotating machinery unless sharp or rough materials are being handled. If gloves are worn because of sharp material, great care should be exercised to prevent their being caught in the machinery.
14. All guards on machines are to be properly adjusted and in working order before starting the machinery.
15. All gear and belt guards must be in place before machine is operated.
16. Machine guards must be kept in position at all times unless removal is authorized for repairs or cleaning.
17. Be sure all is clear before starting any machine.
18. Unless conditions make it impractical, no employee should be permitted to operate electric or mechanical equipment or machines in a building or room when alone.
19. Dull, badly set, improperly filed or improperly tension saws shall be immediately removed

from service as soon as they begin to cause the material to stick, jam or kick back when it is fed to the saw at normal speed. A saw to which gum has adhered shall be cleaned immediately.

20. A push stick made of a narrow strip of wood or similar material with a notch cut in one end and shaped on the other end to provide a good hand grip shall be used to push material through saws where there is possibility of the operator's fingers coming in contact with blades.
21. A jig or fixture shall be used when cutting or forming irregular pieces or oblique angles.
22. All protecting keys, setscrews and other projections in revolving parts shall be made flush or guarded by a substantial metal cover as practicable.
23. All power saws shall be guarded underneath and behind the table to prevent possible personal contact.
24. A mechanical or electrical power shall be provided on each machine which will make it possible for the operator to cut off the power from the machine being operated without leaving his position at the point of operation.
25. Each activity whose operations create dust, shavings, chips or slivers shall be equipped with an exhaust system either continuous or automatic in action, of sufficient strength and capacity to remove such refuse from the points of operation and immediate vicinities of machine and work places.
26. Do not repair, oil or clean machinery while it is in motion. Lubrication while machinery is in motion shall be done by remote control lubricating system.
27. Do not use electrical equipment or machines with frayed or otherwise deteriorated insulation.
28. Electrically driven portable machinery as well as fixed electrical equipment shall have the frame grounded.
29. Machines designed for a fixed location shall be securely anchored to prevent walking or moving.
30. Foot protection (safety shoes) should be considered where there is reasonable possibility of dropping heavy objects. Footwear which is defective or inappropriate to the extent that ordinary use creates possibility of foot injury (open toe sandals or tennis shoes) shall not be worn in shop areas.
31. Do not attempt to remove foreign objects from the eye or body; obtain proper medical treatment.
32. In case of injury, no matter how slight, report it to your supervisor.

BAND SAW SAFETY PROCEDURES

1. Adjustable guards should be kept as close over the point of operation as the work permits.
2. When a band breaks, shut off the machine and stand clear until the machine has stopped.
3. Never stop a machine by pushing material against the band.
4. Cracked saw blades should not be used. A “click” as the blade passes through the work denotes a cracked blade.

CIRCULAR SAW SAFETY PROCEDURES

1. Stand to one side. Do not stand directly in line with work being fed through saw.
2. A rip saw shall not be used for cross cutting not shall a crosscut saw be used for ripping.
3. See that saw blade is in good condition before using. This means sharp, unbroken, free from cracks and the proper saw for the job.
4. Never reach over the saw to obtain material from the other side.
5. Never oil the saw or change the gauge while the machine is running.
6. When shutting off power, never stop the saw quickly by thrusting a piece of wood against it. Be sure the saw has stopped before leaving it.
7. A pusher stick shall be used whenever the size or shape of the piece requires the hands to be near the blade of the saw.

8. The appropriate guards must be kept in place at all times.
9. Speed of Saw: The peripheral speed of circular saws shall not exceed 12,000 feet per minute unless the saw has been manufactured for a higher speed and is so marked.

DRILL PRESS SAFETY PROCEDURES

1. When drilling, tapping or reaming material see that it is securely fastened by blocks or clamps so that it cannot spin. In no case, should the operator rely on his hand to secure the material from turning.
2. When tightening drill or chuck of drill press, be sure to remove release key before starting the machine.
3. Run the drill only at the correct speed. Forcing or feeding too fast may cause broken drills and result in serious injury.
4. An operator should never attempt to loosen the chuck of a tapered shank drill unless the power is turned off.
5. When chucks are being removed from the spindle, the spindle should be lowered close to the table so the chuck will not fall.
6. Never use the hands to remove drilling from the work.

GRINDING SAFETY PROCEDURES

1. All abrasive-wheel machinery shall be equipped with protection hoods, which shall be of such design and flying fragments of a bursting wheel insofar as the operation will permit.
2. Wear a face shield, safety goggles or cover goggles when grinding.
3. Grinding wheels shall be equipped with tool rests which are set not more than one-eighth inch from the wheel.
4. The side of an emery wheel shall not be used for grinding unless it is a special type wheel for that purpose.
5. Stand to one side when starting up a machine and do not exert great pressure on the wheel for that purpose.
6. Report to your supervisor immediately any broken, cracked or otherwise defective wheel.

7. Mounting a new wheel should be done only by an experienced person.
8. Never use a wheel that has been dropped or has received a heavy blow, even though there is no apparent damage. The wheel may be weakened to a point where it may fly apart.
9. An abrasive wheel shall not be operated at a speed in excess of that recommended by the manufacturer of the wheel.

JOINTER AND PLANER SAFETY PROCEDURES

1. Stand to one side. Do not stand directly in line with work being fed through the machines.
2. When pieces shorter than 18 inches are machined, a safety pusher stick of suitable design shall be used.
3. Do not take too heavy a cut as this will cause a kickback.

SIGNS, LABELS AND COLOR CODES

ACCIDENT PREVENTION SIGNS

1. Accident prevention signs are intended to indicate specific hazards of a nature that failure to designate them may lead to accidental injury or property damage. All signs shall conform to the requirements of this chapter and each sign shall include the following:
 - a. An approved heading that indicated the relative hazard.
 - b. A statement of the type of hazard or what to do, or not to do, in the area. Signs shall be visible at all times when work is being performed, and shall be removed or covered promptly when the hazards no longer exist.
2. Danger signs are to be used only where an immediate hazard exists. They indicate that special precautions must be taken. Danger signs are identified by a red upper panel with a block border and the word "DANGER" in white letters. Examples are as follows:

DANGER - "HIGH VOLTAGE"

DANGER - "NO SMOKING"

DANGER - "KEEP OUT"

3. Caution signs are to be used only to warn against potential hazards or to caution against unsafe practices. They indicate possible hazards against which proper precautions should be taken. Caution signs are identified by a black panel with the word "CAUTION" in yellow letters. Example are as follows:

CAUTION - "KEEP AISLES CLEAR"

CAUTION - "EYE PROTECTION REQUIRED"

4. Safety instruction signs are to be used where there is a need for general instructions and suggestions relative to safety measures. They are identified by a green panel with a word such as "THINK" or "BE CAREFUL", etc., in white letters. Examples are as follows:

THINK - "REPORT UNSAFE CONDITIONS"

BE CAREFUL - "WALK DON'T RUN"

5. Directional signs are for providing specific direction-type information. The standard color is black on white and the directional symbol should be dominant. Examples are as follows:

"THIS WAY OUT" - with arrow

"FIRE EXTINGUISHER" - with arrow

6. On radiation warning signs, the standard color of the background shall be yellow, with the symbol and panel magenta or black.
7. The biological hazard warning sign shall be used to signify the presence of a biohazard. The primary symbol color should be fluorescent orange.
8. Blue shall be the standard color for information signs. It may be used as the background color for the complete sign or as a panel at the top of such types of "Notice" signs, which have a white background.
9. The slow-moving vehicle emblem consists of a fluorescent yellow-orange triangle with a dark red reflective border. The emblem is intended as a unique identification for, and it shall be used only on, vehicles which design move slowly (25 m.p.h. or less) on the public roads.

ACCIDENT PREVENTION TAGS

1. Tags are a temporary mean of warning all concerned of a hazardous condition, defective equipment, radiation hazards, etc. The tags are not to be considered as a complete warning method, but should be used until a positive means can be employed to eliminate the hazard; for example, a "DO NOT START" tag on power equipment shall be used for a few moments or a very short time until the switch in the system can be locked out; a "DEFECTIVE EQUIPMENT" tag shall be replaced on a damaged ladder and immediate arrangements made for the ladder to be taken out of service and sent to the repair shop.
2. "DANGER" tags shall be affixed to equipment which is being held out of service for repair

or for equipment which poses an imminent or immediate hazard to the user. Before repair work is performed on equipment, a danger tag shall be attached and the equipment shall be locked out of service.

3. "CAUTION" tags must be affixed to equipment which poses a potential hazard to the user. These tags are also used to warn against an unsafe practice.
4. "NOTICE" tags are to be utilized for conveying safety information or suggestions regarding equipment or conditions.
5. Other tags such as radiation or biological hazard shall use the same symbols and colors as required on signs.
6. During routine inspections of building area, inspectors may affix red danger tags to equipment which is observed in a state of repair or is deemed imminently or potentially hazardous. A time limit may be established for correction. Correction of deficiencies is the responsibility of the department head.

COLOR CODE FOR MARKING PHYSICAL HAZARDS

1. Red shall be the basic color for the identification of:
 - a. Fire protection equipment and apparatus.
 - b. Safety cans or other portable containers of flammable liquids.
 - c. Emergency stop buttons or electrical switches used for emergency stopping of machinery.
 - d. Danger signs.
2. Orange shall be used as the basic color for designating dangerous parts of machines or energized equipment and to emphasize such hazards when enclosure doors are open or when gear or other guards around moving equipment are open or removed, exposing unguarded hazards.
3. Yellow shall be the basic color for designating caution and for marking physical hazards such as: striking against, tripping, and "caught between". Solid yellow, yellow and black stripes, should be used interchangeably, using the combination which will attract the most attention in the particular environment.
4. Green shall be used as the basic color for designating "safety" and the location of first aid equipment.
5. Blue shall be limited to warning against the starting, the use of, or the movement of equipment under repair or being worked upon.
6. Purple shall be the basic color for designating radiation hazards.
7. Black, white or a combination of these two, shall be the basic colors for the designation of

traffic and housekeeping markings.

LABELING OF INJURIOUS SUBSTANCES

1. All containers containing a substance or mixture of substance that are capable of causing injurious effects of the body shall be labeled or marked with an appropriate warning legend as defined in this section.
2. In labeling an injurious substance, the container label shall bear the chemical or common name (not trade name only), of the injurious substance and a signal word such as "danger" or "warning". In addition, the label shall define the hazard and list the precautions.
3. Labels shall not be removed from containers so long as any of the substances or mixtures of substances names on the labels remain in the containers, nor shall any substances other than those which were in the containers when first received be placed in the containers so long as the original labels remain on the containers.
4. The National Fire Protection Association (NFPA) "Hazard Identification System" is a precise way of labeling materials as to their hazardous properties. It is recommended that both containers and areas employ this label system.

Contact the Safety Office for complete details. The NFPA label system identifies the hazards of a material in terms of three principal categories, namely "health," "flammability," and "reactivity (instability)"; this indicated the order of severity numerically by five divisions ranging from "four (4)", indicating a severe hazard, to "zero (0)", indicating no special hazard. This information is presented by a diamond shaped diagram divided into four diamond shaped diagrams. The "health" hazards will always be shown by the diamond on the left (blue background or blue numerals). The "flammability" hazards will always be shown by the diamond at the top (red background or red numerals). "Reactivity" hazards will always be shown by the diamond on the right (yellow background or yellow numerals). The bottom diamond (white) will indicate acid, alkali, corrosive, oxidizer and "use no water".

PIPE MARKING

1. Color bands containing a lettered legend of pipe contents shall be installed on all piping systems used to transport hazardous substances such as gases, vapors, liquids, etc. Marking is to be done at points where confusion would introduce hazard to employees such as valves or outlets. The four colors to be used are as follows:
 - a. Yellow - Dangerous materials such as high pressure steam.
 - b. Red - Fire protection equipment such as sprinkler water.
 - c. Bright Blue - Protective materials such as distilled water.
 - d. Green - Safe materials such as city water.

SAFETY RULES FOR STORAGE AND HOUSEKEEPING

HOUSEKEEPING

Safety starts with housekeeping. A clean, neat and orderly work area is an important reflection of safe work habits and attitudes. Therefore, the following housekeeping rules will apply:

1. All places of employment shall be kept clean and orderly work area is an important reflection of safe work habits and attitudes.
2. Any material spilled on the floor which could cause an accident must be cleaned up immediately.
3. During the course of work, all debris shall be kept reasonably cleared from work areas, and all waste shall be disposed of at intervals determined by the rate of the accumulation and the capacity of the container. Always use container supplies for this purpose.

GENERAL STORAGE RULES

1. All places of employment shall be kept clean and orderly and in a sanitary condition. The floor of each area shall be maintained in a clean and, so far as possible, a dry condition.

Racks, bins, plans, blocks, sheets shall be used where necessary to make the piles stable.
2. Heavy or awkward items should always be stored near the bottom of shelves or cabinets as falling heavy items are a hazard to personnel.
3. All materials shall be stored, handled, and piled with due regard to their fire characteristics.

Noncompatible materials, which may create a fire hazard, shall be segregated by a barrier having a fire resistance of at least 1 hour. Arrangement should permit convenient access for firefighting.
4. Clearance shall be maintained around lights and heating units to prevent ignition of combustible materials.
5. Stacked materials shall have a minimum clearance of thirty-six (36) inches between the top of the stack and the sprinkler system piping and deflectors.
6. In buildings without installed sprinkler systems, the material stack height shall not exceed fifteen (15) feet.
7. All stacks will have a minimum of thirty-six (36) inches clearance between the top of the stacks and joists, rafter or roof trusses.
8. The maximum weight of materials stored on building floors or load carrying platforms, except those built directly on the ground, shall not exceed their safe carrying capability.

9. In warehouse-type storage areas, the following rules apply:
 - a. Aisles and passageways for one-way fork lift traffic shall be not less than the width of the widest vehicle or load plus 3 feet. For two-way fork lift, traffic the minimum width of aisles shall be not less than twice the width of the widest vehicles or loads plus 3 feet.
 - b. Lanes for aisles and passageways shall be painted on the floor, or a similar method employed to mark such areas.
 - c. Black, white, or a combination of these two shall be the basic colors for the designation of traffic and housekeeping markings.

LOOSE MATERIAL STORAGE

1. Materials dumped against walls or partitions shall not be stored to a height that will endanger the stability of such walls and partitions.
2. No employees shall be permitted to work on or over loose material, until they have been instructed in the hazards involved and the precautions that must be taken to prevent employees being caught in caved-in material.
3. In withdrawing materials, no overhanging shall be permitted to exist at any time.

OUTDOOR STORAGE

1. Combustible materials shall be piled with due regard to the stability of piles and in no case higher than 20 feet.
2. Driveways between and around combustible storage piles shall be at least 15 feet wide and maintained free from accumulation of rubbish, equipment or other materials.
3. The entire storage site shall be kept free from accumulation of unnecessary combustible materials. Weeds and grass shall be kept down and a regular procedure provided for the periodic cleanup of the entire area.
4. Storage shall be in orderly and regular piles. No combustible material shall be stored outdoors within 10 feet of a building or structure.
5. Portable fire extinguishing equipment, suitable for the fire hazard involved, shall be provided at convenient, conspicuously accessible locations in the yard area.

SAFETY RULES FOR TOOLS, HAND AND PORTABLE POWERED

HAND TOOLS

1. All hand tools shall be maintained in a safe condition free of worn or defective parts.
2. All tools shall be restricted to the use for which they are intended, and should be used only by those employees who are required and qualified to use such tools.
3. Tools having mushroomed heads, split or defective handles, worn parts or other defects that impair their strength or render them unsafe for the use shall be removed from service and shall not be reissued until the necessary repairs have been made.
4. Goggles shall be worn by persons using hand tools when there is a possibility of flying chips or other materials.

5. Listed below are some condition requirements for specific hand tools:
 - a. Every file or rasp shall be equipped with a securely fitted, substantial handle.
 - b. The head on a hammer shall be wedged securely and squarely on the handle and neither the head or the handle shall be chipped or broken.
 - c. Care shall be taken to select a screwdriver of the proper size to fit the screw. No screwdriver with a split or splintered handle shall be used. The point shall be kept in proper shape with a file or grinding wheel, and screwdriver shall not be used as a substitute punch, chisel, nail puller, etc.
 - d. Only wrenches in good condition shall be used; a bent wrench, if straightened, has been weakened and shall not be used. Also, watch for spring jaws on adjustable wrenches. Always pull toward yourself, never push, since it is easier to brace against a backward pull than a sudden lunge forward should the tool slip or break.
 - e. Pliers shall be kept free from grease and oil and the teeth or cutting edges shall be kept clean and sharp. The fulcrum pin, rivet, or bolt shall be snug but not tight.
 - f. Only saws that are sharp and properly set shall be used. A crosscut saw shall be used for cutting across the grain; a rip saw for cutting with the grain.
 - g. Hack saws should be adjusted in the frame snug and tight enough to prevent buckling. The number of teeth per inch should be selected for the work. Pressure should be on the down stroke only.
 - h. Wrecking bars and crowbars shall be kept sharpened and free from burrs.
 - I. Before shovels are used, they shall be inspected by the worker to be sure that it has a strong, smooth handle and grip free from splinters, and that the blade is smooth and sharp.

POWERED TOOLS

1. Portable power tools shall be kept cleaned, oiled and repaired. They shall be carefully inspected before use. The switches must operate properly and the cords be clean and free from defects. The plug shall be clean and sound.
2. All portable powered tools capable of receiving guards and/or designed to accommodate guards shall be equipped with such guards so as to prevent the operator from having any part of his body in the danger zone during operating cycle.
3. All electric powered portable tools with exposed noncurrent-carrying metal parts of cord and plug connected equipment which are liable to become energized shall be grounded. Portable tools protected by an approved system of double insulation, or its equivalent need not be grounded. Where such approved system is employed, the equipment shall be distinctly marked.
4. All hand-held powered tools of a hazardous nature such as circular saws having a blade diameter greater than 2 inches, chain saws, percussion tools, drills, tappers, fastener drivers, grinders with wheels greater than 2 inches in diameter, disc sanders, belt sanders, reciprocating saws, saber, scroll, and jug saws with blade shanks greater than one-fourth inch, and other similarly operating powered tools shall be equipped with a constant pressure switch or control that will shut off the power when the pressure is released. Other than circular saws, chain saws and percussion tools these tools may have a lock-on control provided that turn off can be accomplished by a single motion of the same finger or fingers that turn it on. All other less hazardous hand-held powered tools, such as routers, may be equipped with a positive "on-off" control.
5. Portable circular saws having a blade diameter over 2 inches, shall be equipped with guards or hoods which will automatically adjust themselves to the work when the saw is in use, so that none of the teeth are exposed to contact above the work; and when withdrawn from the work, the guard shall completely cover the saw to at least the depth of the teeth. The saw shall not be used without a shoe or guide.
6. All pneumatic powered portable tools shall be equipped with an automatic air shut-off valve that stops the tool when the operator's hand is removed. Safety clips or retainers shall be installed on pneumatic tools to prevent tools from being accidentally expelled from the barrel; or other effective means to prevent accidents from this source shall be used.
7. Abrasive wheels with a diameter over 2 inches shall be used only on machines provided with safety guards. The guard shall cover the spindle end, nut and flange projections. Guards on operations where the work provides a suitable measure of protection to the operator may be so constructed that the spindle end, nut and outer flange are exposed.

8. All explosive-activated fastening tools muzzle ends shall have a protective shield or guard designed to confine any flying fragments fired unless it is equipped with a protective shield or guard. A department shall not permit an employee to use a power-actuated tool until he has received training as prescribed by the manufacturer.

POWER MOWERS

1. General requirements:
 - a. Power mowers shall bear a label certifying that they have been constructed in accordance with the provisions of ANSI B71.1-1972.
 - b. Power mowers shall be maintained in safe operating condition in accordance with the Owner's Manual.
 - c. An indicator of blade rotation shall be provided on mowers that operate quietly.
 - d. The controls used for stopping, starting, speed control and attachment engagement shall be clearly identified by a durable level.
 - e. The mower blade shall be enclosed except on the bottom, and the enclosure shall extend 1/8-inch minimum below the lowest cutting point of the blade.
 - f. The discharge opening(s) shall be so placed or guarded that grass or debris will not discharge directly into the operator zone.
 - g. The word "CAUTION" or "DANGER" shall be placed on the mower at or near each discharge opening.
 - h. The blade(s) shall stop rotating within seven seconds after either declutching or shutting off drive power.
2. Operating requirements:
 - a. Area to be cut should be examined for loose objects such as tin cans, pieces of wire or other objects. A serious injury can result from objects thrown by rotating blades.
 - b. The engine will be cut off when filling with gas. No smoking when filling.
 - c. Avoid slopes that are too steep for machine, whether a push mower or riding mower.
 - d. Suitable foot, eye and head protection should be worn when operating power mowers.
3. Walk-behind mowers:

- a. The mower handle shall be fastened to the mower so as to prevent unintentional uncoupling while in operation.
 - b. A mower with a rope starter should be started on a level area free of any loose objects.
 - c. A shut off control device shall be provided to stop operation of the engine. This device shall require manual and intentional activation in order to restart the engine.
4. Riding rotary mowers:
- a. A disconnect device shall be provided between the engine (motor) or power source and blade(s).
 - b. A means shall be provided to prevent the starting of the engine when the wheel drive control is in the engaged position. Such means shall not be required on units equipped with deadman controls.
 - c. A slip-resistant surface or other means shall be provided to minimize the possibility of an operator's foot slipping off the foot support or platform.
 - d. Towed rotary mower attachments shall have no front opening in blade enclosure.

SAFETY RULES FOR VEHICLE OPERATIONS

GENERAL

- 1. Persons who operates vehicles on behalf of the county should extend every courtesy to both traffic and pedestrians.
- 2. Only those employees specifically authorized and who possess a valid Texas Driver's License shall operate vehicles on county business.
- 3. The following rules apply to the operation of vehicles on county business.
 - a. Drivers shall be familiar with and obey all state motor vehicle law that apply to them.
 - b. A driver shall not permit unauthorized persons to drive, operate or ride in or on a county vehicle.
 - c. Seat belts provided will be used.
 - d. Employees shall not permit anyone to ride on the running boards, fenders, or any part of any motorized equipment except on the seats or inside the body walls.
 - e. Employees shall not ride on loose materials or equipment carried on trucks; nor shall they ride on trailers or towed equipment, except when performing a job function.
 - f. Employees shall not jump on or off vehicles in motion.

- g. Drivers shall keep a sharp lookout for pedestrians and for cyclists and be prepared for an immediate stop.
4. The following rules apply to vehicle condition:
- a. Windshields and windows shall be kept clear of anything that may obstruct the vision of the driver.
 - b. Brakes shall be tested by the driver at the start of each day. The driver shall report all defects and they shall be adjusted or repaired before the vehicle is put in operation.
 - c. Lights and other signaling devices shall be inspected daily. If found defective, they shall be repaired before vehicle is placed in operation. No vehicle shall be operated at night unless equipped with properly working headlights, taillights, and other necessary safety devices as required by law.
5. The following rules apply to hauling materials and equipment:
- a. Materials and equipment shall be loaded so they will not cause a hazard by shifting. Heavy equipment and materials shall be securely fastened.
 - b. Red flags during the day and red lights at night shall be attached to equipment or material that extends more than four (4) feet beyond the back of the vehicle. Red flags or approved clearance lights shall be attached to loads extending more than two (2) feet beyond to front of the vehicle.
 - c. Tools, materials or equipment shall not be permitted to extend beyond the permanent fixtures provided on the sides of the truck.
 - d. Trailers or equipment, while being towed, shall be securely coupled to the truck and if necessary joined by auxiliary chains or cable.
 - e. Trucks shall not be operated with tailgates hanging or dangling.
 - f. Vehicles will not be operated unless back-up signals are in operating order.

SAFETY RULES FOR GARAGE AREAS

1. The following rules apply to the use and repair of vehicle batteries:
- a. Battery charging installations shall be located in areas designated for that purpose.
 - b. When charging batteries, the vent caps shall be kept in place to avoid electrolyte spray.
 - c. Facilities for quick drenching of the eyes and body shall be provided within 25 feet

of the battery areas for emergency use.

- d. When using jumper cables to start a second vehicle, follow these procedures to avoid either equipment damage or an explosion:

It must be initially determined whether both vehicles are negatively grounded, (the negative terminal is connected to the engine block or frame), or positively grounded. It must also be determined that both batteries have the same nominal voltage (6 or 12 volts). Do not mix these systems in any way, as damage will occur.

When both vehicles are negatively grounded (which most often is the case), connect the ends of one cable to the positive terminal of each battery. Then connect one end of the other cable to the engine block of the car with the good battery. Finally, connect the other end of this cable to the engine block of the car being started. Do not make this final connection to the negative terminal of the weak battery.

Disconnecting the batteries should be done by reversing this procedure.

2. The following rules apply to the fueling of vehicles and equipment:

- a. No intentional combustion engine fuel tank shall be refilled with a flammable liquid while the motor is running. Fueling shall be done in such a manner that likelihood of spillage is completely, or equivalent action taken to control vapors before restarting the engine. Fuel tank caps shall be replaced before the engine is started.
- b. A gasoline pump shall be provided to service the fuel tanks of all gasoline engine driven equipment. A good metal-to-metal contact shall be kept between fuel supply tank or nozzle of supply hose and the fuel tank.
- c. Open lights, open flames, or sparking or arcing equipment except that which is an integral part of the automotive equipment, shall not be used near fuel storage tanks or internal combustion engine equipment while being fueled with flammable liquids.
- d. No smoking shall be permitted at or near the equipment being fueled. Post a conspicuous sign in each fueling stating: "NO SMOKING WITH 25 FEET".
- e. A dry chemical or carbon dioxide fire extinguisher rated 6.BC or larger shall be in location accessible to the fueling area.

3. The following apply to jacks and their use:

- a. The rated load shall be legible and permanently marked on a prominent location on the jack by casting, stamping or other suitable means.
- b. All jacks shall be designed so that their maximum safe extension cannot be exceeded.
- c. In the absence of a firm foundation, the base of the jack shall be blocked. If there is

a possibility of slippage of the cap, a block shall be placed in-between the cap and the load.

- d. Employees shall not enter the zone beneath a jack-supported load unless it has been effectively blocked or cribbed.
 - e. All jacks requiring cleaning and lubrication, such as screw jacks, shall be properly cleaned and lubricated at regular intervals. The lubricating instructions of the manufacturer should be followed, and only recommended lubrications should be used.
4. The following rules apply to tire inflation:
- a. Tire inflation shall be accomplished by means of a clip-on chuck with a minimum 24-inch length hose to an in-line regulator (factory preset at 40 psi maximum) or a restraining device maybe used as an equivalent.
 - b. Tire inflation control valves shall automatically shut off other air flow when the valve is released by the operator or be of the preset regulator type.
 - c. A tire restraining device, such as a cage, rack or other effective method shall be used while inflating tires mounting on split rims or having retaining rings.

EXCEPTION: While the wheel assembly is mounted on a vehicle, tires may be inflated without a restraining device, provided that remote control inflation equipment is used and all persons stay out of danger area.

SPRAY PAINTING

1. Spray painting operations using flammable or combustible liquids should be separated from other areas by either construction having a fire resistance of at least 2 hours or by being in a separate building. Spray painting should be confined to properly constructed spray booths or rooms.
2. Spray booths shall be substantially constructed of steel, or masonry with interior surfaces smooth and continuous without edges and otherwise designed to prevent pocketing of residues and facilities cleaning. Space with a spray booth having a fontal area greater than 9 square feet should be protected with automatic sprinklers or have a fire curtain or metal door at the other edge of the booth opening.
3. Electrical equipment located within 20 feet of a spraying area shall be installed and maintained in accordance with Chapter 5 of the Nation Electrical Code.
4. All spraying areas shall be kept free from the accumulations of deposits of combustible residues. If there are excessive accumulations of residue in booths, ducts, duct discharge points, or other spraying areas, then all spraying operations should be discontinued until

conditions are corrected.

5. Spraying areas shall be provided with mechanical ventilation adequate to dilute flammable vapors to less than 20 feet of their lower explosive limit.

WELDING, CUTTING AND BRAZING

1. Welding and cutting are done on an ever-increasing variety of metals and metal coatings. Four primary hazards are associated with welding operations: ultraviolet and infrared light, oxides of nitrogen, ozone and metal fumes.
2. Before cutting or welding is permitted, the area shall be inspected by the individual responsible for authorizing cutting and welding operations. Cutting or welding shall be permitted only in areas that are, or have been made, firesafe. Where objects to be welded or cut are not readily movable, all movable fire hazards in the vicinity shall be taken to a safe place.
3. Where objects to be welded or cut are not movable and where fire hazards cannot be removed, then guards shall be used to confine the heat, sparks and slag, and to protect the immovable fire hazards and nearby personnel.
4. Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state of readiness for instant use. It may be necessary to assign additional personnel to guard against fire while the actual welding is being performed, and for a sufficient period of time after the completion of the work to ensure that no possibility of fire exists.
5. No welding, cutting or other work shall be performed on used drums, barrels tank or other containers until they have been cleaned so thoroughly as to make absolutely certain that there are not flammable materials present which when subjected to heat, might produce flammable or toxic vapors.
6. Goggles or other suitable eye protection shall be used during all gas welding or cutting operations. Eye protection shall be provided where needed for brazing operations.
7. All welders should wear flameproof gauntlet gloves. Flameproof aprons may be desirable as protection against radiated heat and sparks. Cotton clothing, if used, should be chemically treated to reduce its combustibility. All clothing should be reasonably free from oil or grease.
8. Local exhaust system providing a minimum air velocity of 100 linear feet per minute in the welding zone shall be used except where not feasible. Mechanical dilution ventilation sufficient to prevent exposures to concentration of airborne contaminants from exceeding those specified in Chapter 3 may be used instead.

9. Respiratory protective equipment shall be used when ventilation is not feasible.
10. Where workplace monitoring records clearly demonstrate that exposure level are not exceeded, neither mechanical ventilation nor respiratory protective equipment is required.
11. Local exhaust ventilation shall be used when potentially hazardous materials are employed as base metals, fluxes, coatings, plating or filler metals. These include, but are not limited to, the following materials:
 - a. Beryllium
 - b. Cadmium
 - c. Chromium
 - d. Fluorides
 - e. Lead
 - f. Mercury
 - g. Zinc
 - h. Inert-gas metal-arc welding or oxygen cutting of stainless steel
12. Where the work permits, the welder shall be enclosed with noncombustible screens having a low reflectivity finish. Booths and screens shall permit circulation of air at floor level. Workers or other persons adjacent to the welding areas shall be protected from the rays by noncombustible or flameproof screens or shields or shall be required to wear appropriate goggles.
13. When operations are suspended for any substantial period of time, such as during lunch or over night, all welding equipment shall be shut off.
14. The frames of all arc welding and cutting machines shall be grounded either through third wire in the cable containing the circuit conductor or through a separate wire which is grounded at the source of the current.
15. All arc welding and cutting cables shall be of the completely insulated, flexible type, capable of handling the maximum current requirements of the work in progress.
16. Mixtures of combustible gases and air are very explosive and shall be carefully guarded against. No device or attachment facilitating or permitting mixture of air or oxygen with combustible gases prior to consumption, except at the burner or in a standard torch or blow pipe, shall be allowed unless approved for the purpose.
17. Acetylene and liquified fuel-gas cylinders shall be placed with valve-end up whenever they are used. If a lead develops at the fusible plug or elsewhere on a cylinder, the cylinder shall be removed well away from any source of ignition, the cylinder valve slightly opened, and the fuel gas allowed to escape slowly. A warning shall be placed near this cylinder not to approach it with a lighted cigarette or other source of ignition. Such a cylinder shall be plainly tagged as defective and in need of repair before refilling.
18. The primary hazard associated with silver soldering is the inhalation of cadmium fumes. Silver solder generally contains 18% to 20% cadmium which is emitted as a fume when silver solder is heated.

Silver soldering operations always should be conducted where local exhaust ventilation is available to remove the cadmium fumes, and also fluoride fumes, which may be emitted from the flux. Sometimes, if it is impractical or nearly impossible to provide exhaust ventilation, the worker should wear an approved respirator with a high efficiency particulate filter.