

Sculpture

Health Hazards and Safe Work Practices

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Plaster:

Health Hazards

- Plaster of Paris (calcium sulfate): slightly irritating to the eyes and respiratory system.
- Additives such as potassium sulfate, potassium alum, borax and lime (calcium oxide) are slightly to moderately toxic.
- Carving or cutting formed plaster.
- Mold releases, such as benzene, are moderately toxic by skin contact and inhalation.
- Application of paint to finish plaster may result in exposure to paint components.

Safe Work Practices

- Wear a dust mask when mixing large quantities of plaster at one time.
- Vacuum or wet mop/ wipe up plaster dust. Do not sweep.
- Carve or cut plaster in direction away from you.
- Wear goggles when chipping plaster.

Clays:

Refer to "Ceramics" for a discussion regarding mixing, firing and glazing clays.

Wax:

Health Hazards

- Beeswax, ceresin, carnauba, tallow, paraffin and microcrystalline wax: overheating may result in the release of flammable wax vapours and decomposition products which are highly irritating to the respiratory tract.
- Solvents are used to dissolve various waxes. Refer to "Solvents, Aerosol Sprays, Acids and Alkalis", for a discussion regarding the health hazards associated with solvent use.
- Chlorinated synthetic waxes are highly toxic by skin contact.

Safe Work Practices

- Do not overheat waxes.
- Exercise safe work practices for solvent use.
- Avoid use of chlorinated synthetic waxes.

Stone:

Health Hazards

- Chipping, grinding or carving create flying chips, which present an eye hazard.
- Back injury may occur from lifting heavy pieces of stone with the incorrect technique.
- Soapstone, turpentine and greenstone may contain asbestos, a highly toxic fibre which may be inhaled.
- Free silica is a component of most hard stones: Chronic inhalation may lead to the development of silicosis. Refer to "Ceramics" for further information.
- Physical injury may result from falling tools on stones.

Safe Work Practices

- Wear a face shield or chipping goggles to protect eyes and face from flying particles.
- Use proper lifting techniques when moving stones.
- Always chip or carve in a direction away from you.
- Wear a NIOSH approved respirator when carving or grinding stones.
- Vacuum or wet mop dust spilled on surfaces. Do not try to sweep.
- Use Asbestos free stones.

Woodworking:

Health Hazards

- Physical injury may result in the absence of appropriate machine guarding and training in machine use.

Wood dust:

- Presents a significant fire hazard
- May cause skin, eye and/or respiratory tract irritation
- Inhalation of cedar dust may result in severe asthma or bronchitis

- Noise: continual exposure to high noise levels may result in permanent hearing loss
- Paint strippers contain various solvents.
- Epoxy and formaldehyde resin glues are highly toxic by inhalation and eye exposure and moderately toxic by skin contact.

Safe Work Practices

- Use local exhaust ventilation systems when provided.
- Wear a NIOSH approved dust respirator in the absence of local exhaust ventilation.
- Wear goggles when using woodworking machines.
- Wear hearing protection if necessary when using noisy machines.
- Ensure woodworking machines have proper guarding before using.
- Do not wear loose articles of clothing or long hair that could get caught in the moving parts of a machine.

- Use water based adhesives, casein glues, hide glues or white glue when an adhesive is required.
- Vacuum all sawdust after work. Do not sweep.

Welding, Brazing or Soldering:

Oxyacetylene and electric arc.

Health Hazards

- Fire hazard in the presence of combustibles is greater with the higher temperature electric arc welding (5500 Degrees Celsius) as compared to the oxyacetylene welding (3500 Degrees Celsius).
- Thermal burns may occur from direct contact with hot metal and flying sparks.
- Ultraviolet radiation irritates the cornea of the eye producing a temporary (24-48 hour) painful feeling of "sand in the eye". It may also cause severe sunburn and skin cancer.
- Intense visible light may cause eyestrain.
- Infrared radiation may cause eye inflammation, skin burns and cataracts.
- Oxygen and acetylene cylinders present a fire and explosion hazard.
- Welding gases which act as asphyxiates may be released: carbon monoxide, unburned acetylene, carbon dioxide, ozone.
- Metal fumes generated from the welded surface or the welding rod may be highly toxic by inhalation. Acute inhalation may cause metal fume fever (flu-like symptoms for 24-48 hours). Chronic inhalation may result in respiratory disorders including lung cancer.
- Fluoride flux fumes are highly toxic by inhalation.
- Highly toxic phosgene gas may be produced from generated ultraviolet light reacting with chlorinated hydrocarbons.
- Zinc coated (Galvanized) metal can cause metal Fume Fever.
- Cadmium coated bolts, washers or nuts can be highly toxic when welded.
- Matches or lighters can explode when exposed to heat or sparks.

Safe Work Practices

- Do not weld, solder or braze in the presence of flammable or combustible materials.
- Do not weld, solder or braze in an area without adequate ventilation, and/or appropriate NIOSH approved respiratory protection.
- For oxyacetylene welding wear welding goggles with a shade number of four to eight. Goggles with a shade number of 10 to 14 should be worn when performing electric arc welding.
- Appropriate protective clothing should be worn: leather gloves, long-sleeved wool shirt and pants and a leather apron.
- Never store oxygen and acetylene cylinders together.
- Never use cylinders without a suitable pressure reducing regulator attached to the cylinder valve.
- Do not transfer gases from one cylinder to another.
- Cylinders must be upright and secured when in use or stored.
- Use friction lighters, not matches to light torches.
- Protect the house from grease, flying sparks, open flames and hot objects.

- Do not use welding, soldering or brazing equipment unless trained in their safe operation.
- Do not weld in the presence of chlorinated hydrocarbons.
- Do not use cadmium containing silver solders.
- Follow hot work Safety Requirements (See Technician).
- Avoid welding galvanized metal.
- Never keep matches or lighter on you.
- Do not weld cadmium coated bolts, washers or nuts.

Metal Casting:

Health Hazards

- The investment mold contains silica, which is toxic by inhalation.
- Wax burnout of investment molds may generate decomposition fumes, which may be irritating to the eyes and respiratory tract.
- Carbon monoxide and carbon dioxide gases are generated from the burning furnace fuel.
- Metal fumes are generated. The toxicity of the metal fume depends upon the metal heated:

Lead: lead metal, bronze and pewter.

Zinc: brass and bronze.

Nickel carbonyl: nickel metal.

- Infrared radiation may cause eye irritation, skin burns and cataracts.
- Back injury may result when lifting, lowering or positioning crucible.

Safe Work Practices

- Wax burn out melting and pouring of metals should be ventilated by appropriate local exhaust systems.
- Goggles should be worn with a shade number of four to five.
- Protective clothing should be worn: woollen long-sleeved shirt insulated leggings, jackets, apron, gloves and foot coverings.
- Manually lift objects within your own capabilities.

Metal Machining (New Section)

Health Hazards

- Physical injury may result in the absence of appropriate machine guarding and training in use of the machine.
- High powered machines such as Mills, Grinders, Lathes and Drill Presses revolve at high speed which can endanger the operator.
- Shears and saws will be sharp and leave sharp burns on metal.
- Hydraulic punches, shears, presses and rollers are dangerous if used improperly.

Noise: continual exposure to high noise levels may result in permanent hearing loss.

Clamp metal to solid surface before Grinding, Milling or Drilling.

Avoid using a pedestal grinder on sheet metal, it can suck metal and your fingers into the machine.

Clamp metal in provided vices before starting to saw or when using the metal chop saw.

Do not wear loose articles of clothing or long hair that could easily get caught in the moving parts of a machine.

Wearing head protection if necessary when using noisy machines.