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ABSTRACT Designed for use in bilingual education programs, this industrial arts safety guide presents guidelines for developing a student safety program and three sections of shop safety practices in both English and Chinese. Safety program format, safety committees, safety inspection, and student accident investigation are discussed in the section on developing a student safety program. Set forth in the section on general safety practices are safety instructions for all areas of industrial arts; safety rules for machine tools, hand tools, and portable electric hand tools; housekeeping; back strains and proper lifting; safe lifting; materials handling; personal practices and conduct; and fire control. Safety procedures relating to automotive and power mechanics; compressed gas; drafting room; dusts, fumes, and combustible materials; foundry practices; flammable and combustible liquids; electricity/electronics; graphic arts; soldering; and storage batteries are covered. Specific machines examined in the section on safety procedures for machines include buffers, drill presses, forges, grinders, jointers, lathes, milling machines; planer-surfacers; presses, sanders, saws, metal shapers, shears, sheet metal machines, and welders. (Corresponding bilingual guides containing material in Korean, Thai, Cambodian, Japanese, and Ilokano are available separately through ERIC--see note.) (MN)
Bilingual Education Resource Series

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Industrial Arts Safety Guide

CHINESE

Dr. Frank B. Brouillet, State Superintendent of Public Instruction

Olympia, Washington 98504
INDUSTRIAL ARTS SAFETY GUIDE

CHINESE VERSION

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INDUSTRIAL ARTS
SAFETY GUIDE

SEATTLE PUBLIC SCHOOLS
Student Section
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導論

意外事件之預防毫無疑問地始自「史前」時期。當人類第一次發現因不安全情況或缺乏知覓而被傷害時，例如：炊火發覺火災不知在炕中或潮濕地方蔓延，他們用棍子從火中移去物品，如他們要操作熱物時大概會用動物皮造的手套，這樣才免於受燒傷。

自那時開始各種預防在工作環境中受傷的方法都已實施。近年來研究發現造成意外的原因人為因素比不安全情況更多。意外的發生多是不安全情況加上不安全行動所致，某警覺情況者及知道怎樣受傷者大概多不會發生意外。

安全是建立在自律上，安全不能沒有它，不留心或舉動不能防止意外，有道理想識及簡單的自律可以防止意外。

在任何情況下「安全第一」為最合適的口號。每個目擊過意外的人都知道在任何活動時都要有安全的工作習慣。工作前不思考最常造成意外的主因，常常意外的做成是由於不當的操作工具，忽略工具或機器的保護，不按保護方式，和不注意不慎重的工作環境。

工業界及政府已盡力的去消除可能會造成危險的情況。並且努力加強機器及工具保護及提供安全的工作環境。

如要預防意外對人中操作的物件要特別小心。在讀完此指南時你會對操作的東西更為熟悉及培養出安全的習慣。

記住 — 安全操縱你！

卅古 EVANS 教學生信 ........... S-1.01

你有何損失？ ............... S-1.02

18-7-1 THIS TRANSLATION OF 7/21/78 SUPERSDDES ALL PREVIOUS TRANSLATION

譯文以英文原文為依據

S-1.00
To the Industrial Arts Student:

As a father, as well as the Governor of the State of Washington, I feel an obligation to write to each of you concerning the importance of safety. The work habits you will be taught in your Industrial Arts class can form the background for safe operation of hand and power tools throughout your life. The need for safety does not stop when you leave the Industrial Arts classroom. It should carry on to your work at home and later, on the job.

It is a waste of the potential of a young life to have a finger, hand or eye lost or mutilated because of a careless act. I hope you will all join me in a dedication to safety in your Industrial Arts classes as well as in the years to come.

Sincerely,

Daniel J. Evans
Governor
What have you got to lose?

Your eyes
Watching television
A sunset
A good book
A friend's smile
An attractive person

Your hands
A game of softball
Buttoning your shirt
Driving a motorcycle
Holding hands with a special person

Your hearing
Laughter of a friend
A bird at your window
A rock concert
The call of your name

Your back
Playing on the beach
Getting into your car
A day skiing
Dancing
A comfortable night's sleep

Your legs
A walk on the beach
A game of tennis
Running and hiking
A bicycle ride

Your life
The remainder of today, every tomorrow. The entire rest of your life.

That's what you've got to lose!
Organized safety programs are a good approach to reducing accidents. There are many types of safety programs. The effectiveness of a good safety program is reflected in the reduction of accidents.

The program on the following pages has suggestions that can be used and/or modified to meet the needs of your school.

- Safety Program Format ..........S-2.01
- Safety Committee Minutes Form ..........S-2.02
- Safety Inspection Check List ..........S-2.03
- Accident Investigation Report ..........S-2.04
SAFETY PROGRAM FORMAT

Organization

Each Industrial Arts class should organize its own safety committee. There should be at least five student members on the committee; two members should be rotated each month. The committee should:

1. Meet every two weeks; more often if the need arises.
2. Review and approve the safety inspection report.
3. Review and discuss all safety recommendations.
4. Study the cause of accidents occurring since the last meeting.
5. Prepare minutes of the meeting and post them on the bulletin board.
6. Maintain a permanent file of accident reports, minutes, and other appropriate materials.
7. Appoint a student safety inspector.

Inspection

Inspection should be made prior to each safety committee meeting. The inspection and written report should reflect the conditions of the area -- housekeeping, fire prevention, first aid equipment, personal protection equipment, unsafe work activities, hazards and guarding needed. Recommendations should be made for corrections.

Education

A bulletin board should be used to alert the class to safe work habits. A member of the committee should post safety materials and minutes of the meetings. Classroom safety meetings should be encouraged with members of the committee participating as leaders.

Accident Reports

Accident reports are an essential part of a good safety program. They help to inform, educate, and remind people of what to look for in regard to accident prevention. They also provide a record of safety items and safety activities.

1. A member of the committee should be assigned to complete accident reports in addition to the instructor's report required by the School District.

2. When a student is injured or is directly responsible for a condition that could cause an injury, that student should be encouraged to cooperate with the committee and attend committee safety meetings.

3. A member of the committee should be assigned to see that action has been taken to prevent a similar accident from taking place in the future.
SAFETY COMMITTEE MINUTES FORM

Class Name and Title Date of Meeting

Period Time Opened

Location Time Closed

Instructor

Members Present:

Order of Business:
1. Review of past recommendations and action taken.
2. Review of accidents since last meeting and suggested corrective measures.
4. Discussion for improvement of the safety program.
5. Selection of chairman and new members for next meeting.

(Use other side of sheet if necessary)
STUDENT ACCIDENT INVESTIGATION REPORT

Class ____________________________ Period ____________ Room ____________

Instructor's Name _________________________________________________________

Name of Injured ____________________________ Date & Time ___________________

Exact Location of Accident ___________________________________________________

Description of Accident* ____________________________________________________

Indicate below with an "X" whether in your opinion accident was caused by one of the following:

PHYSICAL CAUSES

( ) Improper protection (personal or equipment)

( ) Defective tools or equipment

( ) Hazardous arrangement

( ) Improper illumination

( ) Poor housekeeping

( ) Not listed - describe briefly*

PERSONAL CAUSES

( ) Physical or mental defect

( ) Lack of knowledge or skill

( ) Wrong attitude

( ) Use of intoxicants or drugs

( ) Not listed - describe briefly*

UNSAFE ACTS

( ) Working without authority

( ) Failure to secure or warn

( ) Working at unsafe speed

( ) Made safety device inoperative

( ) Used unsafe equipment or hands instead of equipment

( ) Not listed - describe briefly*

( ) Unsafe material handling

( ) Took unsafe position

( ) Worked on moving equipment

( ) Horseplay

( ) Did not use safe clothes or personal protective equipment

NOTE: Make certain of names and descriptions of witnesses, injured sent to hospital, condition of injured, assistance by others, etc.

Actions taken to prevent a similar future accident* ______________________________________

Date of Report ____________________________ Signature ________________________

* USE OTHER SIDE OF SHEET IF NECESSARY.
# STUDENT SAFETY INSPECTION CHECK LIST

Class ___________________ Period __________ Date __________

Hazardous conditions and unsafe acts should be reported so corrective action can be taken. Note also whether potential accident causes, marked "X" on previous inspection, have been corrected.

( ) indicates Satisfactory  
(X) indicates Unsatisfactory

## A. FIRE PROTECTION
1. Extinguishing equipment
2. Exits, stairs and signs
3. Storage of flammable material
4. ___________________________

## B. HOUSEKEEPING
1. Aisles, stairs & floors
2. Storage & piling of material
3. Wash & locker rooms
4. Light and ventilation
5. Disposal of waste
6. ___________________________

## C. TOOLS
1. Power tools, wiring
2. Hand tools
3. Use & storage of tools
4. ___________________________

## D. PERSONAL PROTECTIVE EQUIPMENT
1. Safety glasses or goggles
2. Face shields
3. Gloves
4. Respirators or gas masks
5. Protective clothing
6. ___________________________

## E. MATERIAL HANDLING EQUIPMENT
1. Winches
2. Cranes, hoists, booms
3. Carts
4. Cables, ropes, chains, slings
5. Rigging
6. ___________________________

## F. BULLETIN BOARDS
1. Neat and attractive
2. Display changed regularly
3. Well illuminated
4. ___________________________

## G. MACHINERY
1. Point of operation guards
2. Belts, pulleys, gears, shafts, etc.
3. Maintenance & oil leakage
4. ___________________________

## H. PRESSURE EQUIPMENT
1. Steam equipment
2. Air compressors
3. Gas cylinders and hoses
4. ___________________________

## I. UNSAFE PRACTICES
1. Improper lifting
2. Improper use of protective equipment
3. Horseplay
4. Running in aisles
5. Improper use of air hoses
6. Removing machine guards
7. Work on unguarded machinery
8. ___________________________

## J. FIRST AID
1. First aid kits
2. Stretcher
3. All injuries reported
4. ___________________________

## K. MISCELLANEOUS
1. Acids and
2. New process
3. Dusts, fumes
4. Ladders
5. ___________________________

Signed __________________________

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USE OTHER SIDE OF SHEET FOR DETAILED COMMENTS & RECOMMENDATIONS

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14
General Safe Practices

Safety rules have been developed to alert you to unsafe practices and conditions. These rules, in some cases, are common to all work. In other instances, they are specific to the particular task at hand.

It is important that you learn these rules and apply them to your Industrial Arts and other activities.

Safety Instructions for All Areas of Industrial Arts... S-3.01
Safety Rules for Power Tools............................... S-3.02
Safety Rules for Hand Tools............................... S-3.03
Safety Rules for Portable Electric Hand Tools........ S-3.04
Housekeeping.................................................. S-3.05
Back Strains and Proper Lifting........................... S-3.06
Safe Lifting Cartoon.......................................... S-3.07
Materials Handling............................................ S-3.08
Personal Practices and Conduct............................ S-3.09
Fire Control..................................................... S-3.10
1. 在有危險性的地方工作或操作機器前必先徵得教師准許。
2. 遇有傷害不論大小要馬上報告教師。
3. 法律規定要戴護眼鏡。
4. 假如你的髮型會防礙工作,你得把它束好或戴上頭繩。
5. 實驗室內要穿著合適的衣服,除去或束緊寬大的衣物,頭帶或手飾,捲起衣袖。
6. 遵守有關操作者安全的規則。
7. 與你的班友合作以維護工業藝術之安全計劃。
8. 如學生有不安全之行動時得提醒他/她。
9. 如有任何儀器可能不能操作時得先報告教師。
10. 把工具和材料放在離住角落的地方。
11. 用掃帚清理屑碎,用布去清理油漬的地方。
12. 保持地板和桌面清潔無雜物。
13. 有任何液体濺在地上時得馬上抹乾淨。
14. 確知抽屜和門都關好。
15. 將油布及其它易燃材料放在裝滿之金屬罐内。
16. 操作大,重或長的材料時得小心。
SAFETY RULES FOR POWER TOOLS

動力工具之安全規則

1. 在未有正式指示，不應如何操作及教師未有詳細説明，不要操作機器。
2. 在眼睛可能受到傷害的地方要戴合適的護目鏡。
3. 檢數師檢查你的工作裝置。
4. 在加工前要檢查及調整裝置。
5. 在開動前確認附近無人。
6. 確保要在定位上及正常運轉。
7. 開關機器時不要離去，要待其完全停止為止。
8. 除需需一幫手外則只需一人操作機器。
9. 要遵守一連串中的機器。
10. 在加油或清潔時要斷電。
11. 操作手，刀，切刀及可動的零件要保持安全距離，手指不要碰在有被切刀切到危險的地方。
12. 不要放工具器械或其他物品在機器內。
13. 保持機器四週的地板清潔及液體屑片，工具和其他材料。
14. 操作機器時要全神貫注，不能分心。
15. 永不靠在機器上。
16. 不要用倒掛作永久接電。
17. 當機器有破損或失敗時通知教師。
18. 當除塵工藝品及装置新機器前，先機器完全停止。
1. 在眼睛可能受到伤害的地方要带合适的护目镜。
2. 選擇適合大小和種類的工具,學習使用及運用每一工具。
3. 切割工具一定要好好的磨利和保持好的情況。
4. 不要用手沾及油漬。
5. 小心運用手邊或尖銳之工具,小心保護你自己或其他人。
6. 用鉗於拿稳短少之物。
7. 永不要放工具在口袋內。
8. 用工具時要用絞而用。
9. 不用鬆弛或破裂手柄之工具。
10. 遼孔機和鑽子要妥為保存,銖口以防成傷害。
11. 只用有柄之鑽子。
12. 不用鑽子锤打以免破倽。
13. 不要以螺絲作拉手棒。
14. 不要投機取巧以免造成傷害,所有扭轉器都用其大小力量比例而施用。
15. 不要用一硬銖打在另一硬面上。
16. 用完工具要清潔好放回正常的保存地方。
17. 有破裂或失效時要通知教師。
SAFETY RULES FOR PORTABLE ELECTRIC HAND TOOLS

手提電動工作工具安全完則

1. 使用手提電動工作工具前一定要有有效的接地.
2. 插電前確知開關是否在 "off" 字位置上.
3. 操作任何手提電動工具時一定要戴護眼鏡.
4. 每一裝置的揚上的開關一定要保持不變的(死人型)壓力，
   那就是當鬆掉壓力後便開合壓力.
5. 確知裝備已穩固好，不要裝在溼的地方.
6. 不要穿着鬆大或袋型的衣服，動作中的零件可能會碰到它.
7. 在開動前確知你已站穩，工作間的周邊沒有障礙．
8. 鍵鍳應常檢查看看有無缺裂．
9. 操作手提電動工具時過重的壓力會損害工具和做成意外．
10. 用工具前所有材料應適當地裝好．
11. 在開始前應檢查護鏡，看看它們是否運作正常．
HOUSEKEEPING

Good housekeeping is a key item in accident prevention. It takes the cooperation of all; it can’t be the responsibility of the instructor and custodian alone.

An effective housekeeping program will:

1. Reduce exposures to slips and falls;
2. Reduce fire hazards;
3. Remind individuals of their responsibilities in keeping the laboratory clean and orderly;
4. Organize the housekeeping effort so that everyone assumes their fair share of the task.

Good housekeeping cannot be accomplished by an occasional grand cleanup. A program must be developed for continual cleanup. The following are essential in a good housekeeping program:

1. The equipment is arranged to permit safe and efficient work practices;
2. Materials and supplies are neatly and safely stacked;
3. Sufficient waste containers are provided and used;
4. Floors are clean;
5. Combustible materials are properly disposed of or stored in approved containers;
6. Excess materials and debris are not allowed to remain on benches and in the work areas;
7. Regular inspections are made to maintain clean and orderly conditions.

Items that are necessary for good housekeeping in an Industrial Arts laboratory are:

1. Adequate dust collecting system;
2. Suitable containers for scraps, shavings, chips and other waste material;
3. Adequate storage rooms, shelves, racks, and cabinets for materials and supplies;
4. Splash guards and collecting pans for all machines using and coolants;
5. Brooms, bench brushes, shop towels, and other clear.

IT IS YOUR RESPONSIBILITY TO SEE THAT HOUSEKEEPING AND SUPPLIES ARE PROPERLY USED.
背痛和起重

背痛和起重是常见的工作伤害，但通过学习正确的起重方式可以大大减少背痛的发生。在任何安全计划内，正确的起重方法训练是至关重要的。适当的起重训练可以防止许多伤害。

不正确的起重会终身伤害你。请学习正确的起重方法。
安全起重法

1. 量度一下物件的大小，如你对自己的能力有疑间，不要尝试手提起它。

2. 确定你己站稳，一腿可以前伸以保持平衡。

3. 弯曲双膝作蹲踞，维持背部直竖，双手展开和下垂双膝，靠近物件。

4. 现开始用腿提起，维持物品靠近身体。

5. 提起物品至可携带部位，不要弯曲身体，用腰部转移重心。

6. 在把物品放下时，弯曲双膝，保持背部平直，以物靠身，用臂力和腿力放下物品。
According to the National Safety Council, nearly one in four disabling injuries is directly related to materials handling activities. These accidents include such things as slips and falls while carrying objects, back injuries and hernias from improper lifting practices, chemical and heat burns from failure to use protective clothing or equipment, and mashed or amputated fingers or toes from dropped objects.

Some of the things you can do to reduce the chance of injury to yourself or others when handling materials are:

1. Use the proper aids to handle the materials, such as tongs for hot materials, block and tackle or jacks to lift extra heavy items, and blocks or wedges to keep items from rolling.

2. Don't try to lift heavy objects without help; before you lift make clear who is giving the orders.

3. Use proper lifting techniques (see Page S-3.07).

4. If the material is heavy or sharp use gloves or pads to assure a better grip or to avoid cuts. Be careful of splinters when handling lumber; wear gloves to handle rough lumber.

5. Before you pick up an object be sure that the path you intend to follow is clear.

6. With heavy objects, make a "first lift" before carrying it so that you can get the feel and position.

7. With long objects, such as pipe or ladders, have someone at each end so that they can be safely guided.

8. Be careful not to drop or set heavy objects on your feet or those of other people.

9. Stack materials so that there is no danger of slipping or falling during storage or removal.
PERSONAL PRACTICES AND CONDUCT

Accident prevention is up to you. There are certain basic rules of conduct that you should incorporate in your daily activities. These rules all involve your attitude toward your fellow worker as well as your attitude toward the task at hand. People with a poor job attitude are those that most frequently have accidents.

Orderliness is a desirable quality. Safe workers will have a methodical approach to the job. They will lay out tools neatly so that they are able to approach the project in an orderly manner. They will not clutter up their work area with excessive tools and materials.

A safe worker is a clean worker. Messy jobs require continual cleanup of the work area and frequently of the worker.

Horseplay in the laboratory will not be tolerated. Severe accidents often have occurred because individuals:

1. Threw items in the laboratory;
2. Ran in the laboratory;
3. Lacked consideration for others;
4. Directed compressed air toward others;
5. Played tricks on others -- hot metal, electrical shock, glue in pockets, etc.;
6. Did not adhere to the accepted safe practices of a laboratory environment.
FIRE CONTROL

The fighting of fires is normally left to professional fire fighters such as the local fire department, but the student should know how to extinguish fires.

Serious fires may occur in the Industrial Arts laboratory in spite of the efforts of everyone. Should this happen, the procedure will be:

1. Sound the alarm, both locally and to the fire department.
2. If a person's clothing is on fire, extinguish it. Water is most effective. Do not let a person with burning clothing run. (Melted, synthetic clothing can give serious burns if extinguished by rolling on the floor or using a blanket.)
3. Evacuate to a safe spot clear of the fire area and remain in a group so it will be easy to check for missing persons.
4. When the fire has been extinguished, clean up and protect wet or damaged equipment and materials. Be alert for rekindling of the fire.

Fires and Extinguishers

There are four principal classes of fires. No one extinguishing agent works well on all, although some work on most.

Class A: This is the most frequently found fire involving wood, paper, rubber and most plastics. Use water, chemical extinguishing solutions containing water, or Class A dry chemical (they crust and smother the glowing embers).

Class B: Flammable liquids are commonly used in the Industrial Arts laboratory and can be difficult to extinguish. Dry chemicals are most effective, followed by foam, inert gas, and water spray. A flammable liquid fire in a container can be extinguished by putting a lid on the container. Remember that the heat from a flammable liquid fire can quickly ignite wood or paper in the vicinity, making extinguishment more difficult.

Class C: This covers electrical fires. Remember that the first step in extinguishing an electrical fire is shutting off the power to the equipment that is on fire. Then extinguishers with a Class C rating may be used to complete extinguishment. It may be necessary to use water if the electrical fire has involved other combustible materials. AVOID USING WATER ON ELECTRICAL EQUIPMENT THAT IS NOT DE-ENERGIZED UNLESS IT IS APPLIED FINE SPRAY, AND EVEN THEN CAUTION MUST BE TAKEN TO ELECTRICAL SHOCK FROM TOUCHING "LIVE" SURFACES.

Class D: Certain metals such as magnesium may burn intensely. In general the extinguishing involves excluding air and moisture with dry sand or metal fire extinguishing powder.
Safety Practices...Specific Processes and Operations

In spite of one's knowledge of general safety, alertness to potential hazards, or desire to "be safe", there are certain processes and operations that require specific knowledge in order to avoid injury.

Safety rules for specific areas are as follows:

- Automotive and Power Mechanics .............. S-4.01
- Compressed Gas .................................. S-4.04
- Drafting Room Safety Practices ............... S-4.05
- Dusts, Fumes & Combustible Metals .......... S-4.06
- Electricity/Electronics ............................. S-4.07
- Flammable & Combustible Liquids ............. S-4.08
- Foundry Safe Practices ............................. S-4.10
- Graphic Arts ........................................ S-4.11
- Plastics ............................................. S-4.15
- Soldering .............................................. S-4.16
- Storage Batteries ................................... S-4.17

Note to Teacher and Students: This guide is not intended to provide all of the instructional and safe practices information that students will need to know to successfully and safely participate in their Industrial Arts activities. Each instructor and student is expected to seek out and use additional instructional material. Highly technical information not available in the average text should be obtained by contacting specialists in the field.

Additional information on safety and hygiene may be obtained from:

- Department of Labor and Industries
  Division of Industrial Safety and Health
  *P. O. Box 207, Olympia, Washington 98507

- United States Department of Labor
  Federal Office Building, Room 6048
  909 First Avenue
  Seattle, Washington 98174

- University of Washington
  Department of Environmental Health
  Health Sciences Building
  Seattle, Washington 98105

*Or the office of Labor and Industries nearest your school.
AUTOMOTIVE AND POWER MECHANICS

In repairing automotive and power equipment, safety is of prime importance. A good mechanician must know how to work safely, and must always be conscious of safety. He should use safety devices, and wear safety clothing.

以下是一些你可能遇到的危险和安全措施。

普通预防措施 General Precautions
1. 只有在维修机器时才加油或调整正在转动中的零件。
2. 在加油或刷机时要小心。
3. 工作时机器和零件要放在“停止”“OFF”位置上。
4. 只在机器停止时才束紧皮带。
5. 不要在机器和熄灭系统附近工作。
6. 不要混用机油和汽油与引擎机内。
7. 在维修机械时特别小心 —— 提供防火设备。
8. 不要直接在其他学生上工作。
9. 在开盖子前要等放热器冷却才好。
10. 在操作机器时必须盖着头在正确位置上。
11. 在操作机器时须将盖子都已适当地绑好。

个人健康之危险性 Personal Health Hazards
1. 喷雾时要戴口罩。
2. 不要以涂绘或汽油成未经稀释的苯来防虫。
3. 不能在机器中插入零件时要避免背部受伤。
4. 永不要把手放在后油枪上。
5. 操作时要穿著和盖好。
6. 不要穿宽松或太长的衣物。
Jacking and Hoisting

1. 假如有学生在下面不要升起车辆。
2. 在车辆下工作时一定要用千斤顶。
3. 当使用千斤顶时避免过度的摇摆车辆。
4. 在学生开始在车辆下工作前要教师先检查千斤顶。
5. 长形的千斤顶可用做或危险应先把它拿走。
6. 不要用横杆千斤顶。
7. 当车辆上提升时不要发动机器。
8. 放下车辆时要小心。

Driving and Locating the Vehicle for Work

1. 在工厂中驾驶汽车时不要戴有限制视镜的护目镜。
2. 车辆只应由有有效驾驶执照的学生驾驶并要有教师之准许。
3. 修理汽车时不应用单位在其繁忙的通道或窄小通道上。
4. 拖和拖车只能在教师准许时才可。
5. 需要把车辆在停车场地方时要有另一学生作引导。
6. 当引擎发动时，一定要有人坐在驾驶座上。

Greases, Oils, Fuels and Solvents

1. 身上清理和通风溢出燃料。
2. 只用准备的溶剂去清理零件，不要用汽油。
3. 在发动引擎前确保有关的通风设备。
4. 将油渍的部件放进准备的废物箱内。
5. 发动引擎前检查燃料接口及是否有泄漏孔。
6. 将易燃液体放在准备的密封容器内。

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Air Pressure

1. Measure the air pressure using an air pressure meter.
2. When using a "snap ring" type of wrench, always ensure the wrench is correctly positioned.
3. Never point the exhaust towards other areas or your body.

Wrenches and Tools

1. Keep all tools clean and free from oil or grease.
2. Always store tools on a rack.
3. Check that the wrenches are in good condition.
4. Never overtighten the tool.
5. Use the correct tools for the job — never use a tool for something it was not intended.
6. Always store tools on a rack when not in use.
7. Never use a wrench as a hammer.

Carbon Monoxide

Carbon monoxide is a toxic gas. It is formed when fuel, including gasoline, is not fully burned. When the engine is running, it is in the exhaust. A single breath of carbon monoxide in a confined area can be fatal. This is why it is so important to always operate engines in open, well-ventilated areas.
压缩气体 COMPRESSED GAS

最常用来切割和熔接的气体有氧气和乙炔, 但是你亦可能使用氢气, 氦气、
氢气、氮气、丙烷、乙烯、丙烯等。这些气体在使用时要特别小心, 以避免
发生意外。使用压缩气体时要牢记以下几点:

1. 使用压缩气体时要戴好防护面罩, 以免吸入有害气体。
2. 使用前要确保设备完好, 无泄漏。
3. 使用时要保持周围环境的通风良好。
4. 使用后要及时关闭气源, 防止气体泄漏。

易燃气体 Flammable Gases

乙炔、氮气和氢气是极危险的气体, 使用时要特别小心。使用前要确保
设备完好, 无泄漏。使用时要保持周围环境的通风良好。使用后要及时关
闭气源, 防止气体泄漏。

氧气 Oxygen

氧气是一种无色、无味的气体, 吸入氧气可以提高人的体能, 但吸入过
量的氧气会使人感到头晕、恶心。使用氧气时要特别小心, 以防止发生
意外。

非易燃气体 Non-Flammable Gases

这些气体包括氢气、氮气、氮气、二氧化碳等。这些气体对生命没有危
害, 但使用时要保持周围环境的通风良好。使用后要及时关闭气源, 防止
gases leakage.
製圖室安全練習 

雖然製圖室存在之危險性比較少, 但以下之安全因素一定要顧慮到:

1. 製圖室中之切紙刀可能會帶來嚴重的割傷或夾傷, 大部份時間應安裝在固定的位置上, 不用時, 把它鎖好, 切刀之保護柵不應離桌子等尖銳物以上, 以定位在操作者之手部及刀鉗之間, 不要移去護蓋。

2. Ozalid 印紙和沖印紙, 因要用氯, 所以要特別注意安全指導, 在氯化液體燃燒時很毒, 故只能在通風的地方操作, 當告訴學生不要吸入氯氣, 如氯酸沾在皮膚上, 应馬上用肥皂或清水洗淨。

3. 不正確之操作, 羅盤, 分切器, 或硬鉛筆等利器會使皮膚受傷, 只由眼睛受傷引起血液中毒。

4. 確和你坐的凳子或椅子要脚著地, 動作中的凳子或椅子跌下會導致製圖室中主要的受傷問題。

5. 小心調整可調整的格頂。
在工藝實驗室中，有些人會對塵埃或氣體(如燃燒金屬產生之碎粒)感到不適，有些碎粒富有高度易燃性或爆炸性，其可能導致嚴重的或永久性疾病。以下之四點為重要的防止室內爆炸之方法：
1. 用通風設備將去工作地點之塵埃。
2. 所產生之塵埃用吸塵機或排氣機去。
3. 在工作生塵埃之操作時戴上呼吸器。
4. 在切割，焊接或磨銅鋅金屬前請戴面罩。

金屬雖有危險性，如切割或打孔或磨作時要特別小心，當操作此類金屬時一定要戴上呼吸器或護具。

有些金屬如錫等都是易燃的或不穩定的，不應用於工藝實驗室中。當操作鋁或銅時，不論是否燃燒，銅鋁銅接，溶化，或打磨，一定要有通風設備。
電力和電子 ELECTRICITY/ELECTRONICS

1. 當銅接時要戴合適的護目鏡。
2. 當銅接或分銅時，永不要輕擊熔化的焊。
3. 進出以安全測試方法判定為主要顧慮到所有的電線或插頭都是通電和熱的。
4. 不要拋棄開放查看其結果。
5. 要換電線時開掉電源。
6. 機器或其產品或其製造的電線或連接的位置及原因。裝裝性電路和電線故障安為安全通電線。
7. 只在安全停止後才更換電線。
8. 在使用電器前務必關電源。
9. 機器或其產品或其製造的電器工作未安裝稳固。
10. 不要自己破壞電器用品。
11. 高壓電液之遠離接地之子，要電器用品，用一孤立之電箱器。
12. 在觸摸前確定電器已無電。
13. 機器或其產品或其製造的電器工作未安裝稳固。
14. 機器或其產品或其製造的電器工作未安裝稳固。
15. 當操作電線或其產品或其製造的電器工作未安裝稳固。
16. 機器或其產品或其製造的電器工作未安裝稳固。
17. 機器或其產品或其製造的電器工作未安裝稳固。
18. 依遵守操作和存放電池。
容易起火和燃烧之液体

在很多工藝課中易起火和燃烧之液体是重要的，它们一定要有高度的
安全性之存放和使用。

在用這些原料前需閱讀容器上之標籤說明。

容易起火和燃烧之液体之特性之危險性因素

1. 很多比空氣為重之蒸氣體聚集在地板上或並低角落上，等待散發的火花。
2. 很多已烯氧化放熱，所以如材料與其接觸便會起隨之着火。
3. 含有高含量氧化合在人體內之神經和/或排泄系統之侵害。
4. 假如吸入人體內全部都有害。
5. 大部分有毒氣體在皮膚上之保護油常接觸之結果會做成皮膚炎。
6. 專用於在皮膚上之磨力燃燒，有適合之滅火器具很難撲滅。
7. 當燃燒時，大部份的易燃液體會產生濃煙，使你在施救火前要先毒室。

要安全地存放和操作容易起火和燃烧之液体

1. 確知先要抽風機/扇子易燃液体存藏室內通風。
2. 三拿物質行課所常用之份量。
3. 遵照教師指示將廢物或多餘材料放在有蓋之容器。
4. 用僞斗側液體入小的量器內。
5. 醫上清理髒水和水滴，遵照指示處理布碎和廢料。
6. 閱讀和遵照指示操作和混合化學料時用樹脂。
7. 不要將樹脂倒倒口瓶中。
8. 常將樹脂倒倒樹脂中，不要將樹脂倒倒化學料中。
9. 不要將樹脂塗在其他完成原料用在割切，焊接，模切或其他熱的
10. 這和工作間通風良好。
11. 塗漆原料或溶料放在存裝容器或準許之罐內。
12. 運操作epoxy和polyester樹脂時戴膠手套減少皮膚受傷
13. 在離開工作間時洗手及其他觸及之皮膚。
以下是一些有更大危险性的易燃液体,你今生实验中遇到时。

Starting fluid 防燃液
**Aerosol cans 气雾溶胶
Gasoline 汽油
*Catalysts M.E.K. Peroxide 活化剂
Carburetor Cleaner 汽化器清洁剂
Acetone 丙酮
Lacquer and lacquer thinner 漆
Adhering liquid (for skin-screen process) 黏液
Paint thinner 油漆溶剂
Alcohol 酒精
Shellac 蜡
*Japan dryer 干燥
Kerosene 煤油
Paint 油漆
Resin (polyester) 树脂
Stain and varnish 染剂
Danish oil 丹麦油。

* 避免有机溶剂混合时这些原料会加速燃烧或猛烈反应。

** 油罐中毒症之化学推進剂其使用危险性可能会有极大不同。
鑄造工場之安全練習

在鑄造工場內要常時遵守安全練習，不正確之操作溶化的金屬會造成嚴重的三級燒傷，使體質破壞性。

1. 當操作鋁合金時，要穿著保護衣服，如安全眼鏡、面罩、頭盔、圍巾、護袖、
   和厚棉手套，不能穿著網球鞋、拖鞋。

2. 常假設以下工作危險的：坩錫、熱頭機、鑄件，及其他儀器，在拿起這些物品前需知其為危險。

3. 開鋼模時，應該於教師之檢查，確知倒模時已不是過溼——它會爆炸。

4. 將熔化後的金屬放置於遠離鑄造工場處。

5. 只在教師之監督下點燃火鍋，按著製造商之指示，以下普通可行之步驟：
   a. 打開工作間之通風扇。
   b. 打開火鍋，讓空氣流通二分鍾。
   c. 減少空氣流通。
   d. 在火鍋內裝一火柴。
   e. 慢慢加熱，如燒火，再用(a) 之方法。
   f. 慢慢加速空氣流通。
   g. 調整火柴使其燃於鍋內。

6. 在移去錫鍋前，關掉火，再關空氣，用坩錫和工具從鍋中移去錫鍋。

7. 搬運溶化合金時，要量接近地面，用二人傾側器。

8. 除減黃砂外，隔離水或油物於鑄造工場外。

9. 鑄造工場之地板應用砂保護其以防意外性地溶化金屬倒於地上所引起的爆炸。

10. 在熔液時 (Stryrofoam)，注滿錫型口盤以防著火；打開工坊之通風扇，不要吸到煙。

11. 在熟練或氯化碳溶倒模時，模型之兩邊應裝箱，及以細粉灰之青砂丁敷箱，不要吸到煙。
圖藝 GRAPHIC ARTS

有很多在圖藝所用的器材和用具都是多的，尖的，膚的，或難以操作的，測量一下工具之大小或後如有必要請別人家增，認識器材之附有之精細特性，不要善用損壞它。

以下是圖藝間之安全預應

暗房 Dark Room
1. 在暗房時打開通風器。
2. 化學品不應放在玻璃瓶或高架上，因其可能掉下造成傷害。
3. 溫度化學品時要戴化學護目鏡和圍巾，當將酸倒入水中，不要將水倒進酸中。
4. 護沖底片或混合化學品時要戴護手套和鉗子。
5. 護沖底片或混合化學品時有中毒性的學生一定要帶手套。
6. 在暗房工作時學生手部要離開胸部。
7. 在暗房工作時學生應小心洗手。
8. 在接近泡盤附近不應用手提式電器。
9. 在暗房內不得有不安全之行為。
10. 隨馬上抹乾溼水。
11. 避免化學品沾在衣服上，這可能會做成皮膚不舒服。

乾框（盛未）Dry Mount
1. 學生應小心避免被盛斗燒傷，
2. 乾框之熱度由教師固定。
3. 工作完成後放置盛斗之搖頭。
4. 不要將乾的盛斗放在紙上或桌上，但要把它放回原架上。
5. 損壞的電線如搖頭告訴教師。
6. 不要用手去試盛斗之熱度。

S-4.11
操作摄影机  Process Camera

1. 不要触摸热灯.
2. 避免用摄影灯对着学生眼睛.
3. 在玻璃槽印极附近小心操作.

凸版印刷  Offset Press

1. 在调整、清理、加油和清理插槽前先把印版停好.
2. 在操作时不要伸手过印版.
3. 研究印版机件失灵时应把它推开. 继续操作前告诉教师. 不要
   离开去修理.
4. 操作印版的速度要遵守教师的指示.
5. 清理操作中两印版要特别小心.
6. 没有教师在场不要在印版上用工具.
7. 确知印版台穿着应服从工作安全很重要. 除去宽衣、领带、或手镯.
   把衣袖挽上肘上.
8. 假如你的头发可能今带来危险性, 你一定要把它束好. 或戴拢鬟.
9. 常保持接触镜清.

切板 (STRIPPING TABLE)

1. 所有材料不要接近玻璃因此不会打破.
2. 用切板时用手指靠近切板地方.
3. 剪切工具应妥善存放及保持锐利.
### 据纸机 Folding Machine
1. 当机器在转动时不要尝试去移走碎纸的纸.
2. 更改时停顿电源.
3. 将所有工具移开据纸机枝外.
4. 确知电线已被接去.

### 切纸机 Paper Cutter
1. 切刀已能由教员更换.
2. 除要被切的纸外任何东西都不要放在切板上.
3. 保持切板附近地板清洁. 把切碎纸放走废纸箱中.
4. 在整个切纸过程中. 持双子放下横杆上. 至双子离开横杆前确保
切刀位置正确.
5. 永不要将钳子提高过刀头.

### 裁板器 Plate Maker
1. 在更换碳纸或调整前停止裁板器. 小心把的碳纸.
2. 操作时不要看圆光.
3. 小心不要把空心架的玻璃打碎.

### 纸孔机 Paper Drill
1. 提防打孔突起是热的.
2. 当打孔时付手. 閒开打孔部位.
3. 常保持脚下乾净.

### 空气槽 Air Brush
1. 請教員接頭或停止高低枝的調整器.
2. 不要調整調整器.
3. 小心不要喷在学生脸上.
墨器印刷 Sign Press
1. 不要撒或投活字型。
2. 小心把活字型浸在墨筒。
3. 只用特别之清洁剂来清理活字和印机。
4. 当清理时不要带印机。

压印机 Platen Press
1. 去模板放下时请于离开压印机。
2. 去印刷时不要取出或调整模板。
3. 遵循指示清理压印油墨和油筒。

刻印 Engraving
1. 当刻印时一定要戴手套。
2. 不要将手放在刻刀之下。
3. 需要更换或调整刻印刀。

自動溫度紀錄器 Thermography
1. 隨燃烧凹槽热时学生一定要带手套。
2. 学生在工作间不使用电灯。
3. 在灯亮或工作不作燃烧时不离开工作间。

橡皮印和盖印 Rubber Stamp and Gold Stamping
1. 用燃烧原料时要小心操作。
2. 保持工作间清洁。
3. 不要撒或掷活字。
1. 戴合適的護眼鏡。
2. 除非你已明白混合物之反應，永遠不要混合任何東西。
3. 如果可能，會散出毒氣，應用通風設備。
4. 多數溶劑和樹脂會產生低於閃勵點之濃縮蒸氣，在操作此類蒸料時不得用氧大燃燒。
5. 穿戴合適之保護物防止原料引起之皮膚不適——如穿戴手套和頭罩等。
6. 操作熱的塑膠時戴保護手套。
7. 當處理維護或其它含產生危險性廢液之原料時戴面罩和呼吸器。
8. 將低閃勵點之原料放在冰箱中。
9. 操作化任何塑膠機械時將所有護蓋定位。
10. 每個熔融單位都應有警告符號和保護。
11. 只用教師提議之原料及程序去注射來模工程。
12. 清理和放回所有工具至正確存放地方，正確地處置所有易燃原料。
13. 有些堆化反應會產生大量的熱，這些東西會在金屬容器內混合。
14. 常以堆化劑加入樹脂內，不要把樹脂加入堆化劑內。
SOLDERING

1. 戴合適的護目鏡。
2. 在開始點焊焊接前，確認焊氣已開啓。
3. 假如火爐沒有自動點火，
   a. 以火柴或燃着之紙放入火中。
   b. 開啓焊氣直到其燃燒。
   c. 調整火大使其在火內燃燒。
4. 在良好通风設備下工作。
5. 不要在焊接過程中吸入煙霧。
6. 小心地從銅上移走熔錫之鉛化鋅。
7. 及時清理落下之鉛化鋅。
8. 焊接後洗手，鉛化鋅會燒傷皮膚或損害衣物。
9. 如被酸燒傷應立即用水沖洗。
10. 小心防止被金屬的迅速傳熱。
11. 不要在個人或生活的工作間內用電槍或電器。
12. 用電棒槍和碳棒時小心不要觸碰到燃着電池。
13. 管理工作間。
14. 不要在有人接觸下把留下熱的金屬。
你最可能接觸到儲藏之電池為汽車電池.因其大之體積及其普通性,有時我們會在使用電池時稍於不小心.

以下是安全預防之規則

1. 電池之儲藏或充電只能在有良好通風設備下進行.不要吸入電池之酸氣.
2. 任何引起燃燒的原因都要遠離電池之儲藏地方; 即是: 不准吸煙,不准用火柴,不用工具撞擊產生火花.
3. 在儲電或充電時,不要操作電池.
4. 電池處理電池時要著合適之保護衣服如膠手套,面罩,圍巾等.
5. 在電池附近不應有金屬物如戒指,手鐲,或鍾錶.
6. 沖電池充電時有水花濺起洗眼盤.
7. 用酸的或鈉電液,或碳酸鈉溶液,或專用水可以中和硫酸溶液.
8. 只有在充電器已開好及蓋好時,才能接觸或除走電池充電器.

以下是極嚴重之潛在危險:

1. 不適當接電引起爆炸.
2. 不適當處理會使酸液與手.
3. 不適當之提升物件會傷背部.
Safety Practices...Machines

Safety rules for the following machines are included in this section.

Buffer................................................................. S-5.01
Drill Press............................................................. S-5.03
Forge, Gas............................................................ S-5.05
Grinder................................................................. S-5.07
Jointer................................................................. S-5.09
Lathe, Metal......................................................... S-5.11
Lathe, Wood......................................................... S-5.13
Milling Machine..................................................... S-5.15
Planer-Surfacer...................................................... S-5.17
Press, Offset Printing............................................. S-5.19
Sander, Portable Belt............................................. S-5.21
Saw, Band............................................................... S-5.23
Saw, Portable Circular............................................. S-5.25
Saw, Radial Arm..................................................... S-5.27
Saw, Scroll............................................................ S-5.29
Saw, Table.............................................................. S-5.31
Shaper, Metal......................................................... S-5.33
Shear, Metal Squaring............................................. S-5.35
Sheet Metal Machines............................................. S-5.37
Welder, Arc............................................................ S-5.39
Welder, Oxy-Acetylene............................................ S-5.41
OBTAIN PERMISSION FROM THE INSTRUCTOR BEFORE USING THIS MACHINE.

**Buffer**

1. Always buff using the lower half of the wheel (below center).
2. Always wear eye protection when buffing.
3. Always stand to one side of the wheel when buffing and when applying compound.
4. Never use a rag to hold the work while you are buffing.
5. Use extra caution when buffing around corners, openings or areas where the wheel could grab and throw the work. Do not buff small diameter tubing, wires, chain or similar material.
6. Exercise caution so that the work does not overheat and burn your hands.
7. Be sure the area behind the buffer is open and that no one else is in the safety zone.
8. If your hairstyle presents a potential hazard, you must fasten it securely or wear a protective hair cover.
9. Remove or fasten any loose clothing, neckties or jewelry. Roll loose sleeves to the elbow.

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**Chinese Version**

1. 操作时常用磨轮之下半部 (球以下).
2. 操作时戴护目.
3. 操作时需站立在磨轮之旁.
4. 操作时不要用碎布等拿持物品.
5. 在磨角或其他有障碍的地方要特别小心. 因为磨子可能将物借用, 所以不要将细小圆头铁条、绳索或其他类似物品.
6. 小心操作以防磨头过热, 烧伤皮手.
7. 操作前将头发扎起, 以免挂在安全区内.
8. 如果你的头髪有危险操作可能会受伤, 可把它束好或戴髪罩.
9. 除去或束紧宽大衣领、领带或珠宝, 将宽大衣袖提起.
SAFETY QUIZ

1. A rag should be used to hold hot objects while buffing.
   T   F

2. Always buff on the lower half of the wheel.
   T   F

3. Loose clothing or hair must be confined.
   T   F

4. Goggles must be worn when buffing.
   T   F

5. Use extra caution when buffing corners or confined areas of the work.
   T   F

中文翻译:

安全测试

1. 使用布料来握住热物体。
   是   否

2. 总是将布料放在轮子的下部。
   是   否

3. 松散的衣物或头发必须束紧。
   是   否

4. 在抛光时必须佩戴护目镜。
   是   否

5. 在抛光角落或受限区域时要小心。
   是   否
OBTAIN PERMISSION FROM THE INSTRUCTOR BEFORE USING THIS MACHINE.

**Drill Press**

**SAFETY SUGGESTIONS**

1. Wear appropriate eye protection
2. Remove jewelry - eliminate loose clothing - confine long hair.
3. Operate only when all guards are in place.
4. Select properly sharpened drill bit - tighten in chuck and remove key.
5. Clamp material - check for safety - turn off power.
6. If a piece of work is caught in the drill -- turn off power -- do not try to stop by hand.
7. Select speed carefully -- the larger the drill the slower the speed.

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**Chinese Version**

安全建議

1. 戴適當之護眼鏡。
2. 除去手飾及寬大衣領，束起頭髮。
3. 當所有護罩都安當時方可操作。
4. 選擇適當之鑽頭，鎖緊木塞，拿去鑰。
5. 檢查護罩安全，滑動位置。
6. 如某一物件卡住打孔機內部應慢轉機器，不要用力去停止馬達。
7. 小心選擇速度，較大的速度愈少。
SAFETY QUIZ

1. It is necessary to select the proper speed. T F
2. The chuck key should be kept in the chuck at all times. T F
3. Work should always be secured. T F
4. Rings may be worn while operating a drill press. T F
5. A chip brush should be used for removing chips. T F
6. The drill should be operated at top speed for all work. T F
7. The long end of the work should be at the left of the operator. T F
8. Long hair must be confined in a hat or net, or tied back. T F

安全测验

1. 有必要去选择適當的速度
2. 要常常留在管内
3. 操作時要常戴好
4. 操作時可以戴戒指
5. 可用掃去清理碎屑
6. 在任何操作時圈內以最高速度操作鑽木
7. 工具之末端應在操作者之左邊
8. 長髮應束好在後面或束在帽子或頭網內
SAFETY SUGGESTIONS

1. Approved eye protection must be worn when operating forge.
2. Asbestos mittens (gloves) must be worn when the tongs cannot be used.
3. A pail of water should be nearby at all times.
4. Hot metal left unattended should be marked "HOT" with chalk.
5. The top must be open when lighting the forge.
6. When shutting down, the gas control should be turned off first.
7. Be sure gas is off "tight" when leaving the forge.

1. UD HANDLE 蓋柄
2. FIREBRICK 对火磚
3. FIREBOX 火箱
4. WORK RACK 工作支架
5. AIR CONTROL 送風控制
6. BLOWER 風扇
7. BLOWER MOTOR 風扇馬達
8. GAS CONTROL 煤氣控制器

Chinese Version

安全建議

1. 需操作編按時要載面罩．
2. 如不能用鉗子時一定要帶手套．
3. 隨時在工作地點附近放一桶水．
4. 熱的金屬一定要用粉筆寫上"熱字 "HOT"．
5. 燃引綴編按時要打開蓋頂．
6. 燃熄火時要先關去煤氣控制器．
7. 在離開編按時要確認煤氣已關緊．
SAFETY QUIZ

1. Tongs should be available for the handling of hot metal.  
   T  F

2. Gloves should be worn when handling the tongs.  
   T  F

3. The top slot should be closed when lighting the forge.  
   T  F

4. The air should be turned off first when shutting down.  
   T  F

5. Hot metal should be marked "HOT".  
   T  F
SAFETY SUGGESTIONS

1. Eye protection must be worn at all times.
2. All guards must be properly adjusted.
3. The tool rest must be adjusted to 1/8" from the wheel.
4. Do not grind on the side of the grinding wheel.
5. Spark deflector or top guard must be within 1/8" of wheel.
6. Small pieces should be held with "vise grip" type pliers.
7. A wheel that is excessively worn or cracked should be discarded.
8. The glass safety shield should be clean.
9. Stand to one side when starting the machine.
SAFETY QUIZ

1. The tool rest should be adjusted to within 1/3" of wheel. T F
2. Eye protection is not always necessary while grinding. T F
3. Once the "off" switch is in the off position, the operator may leave. T F
4. The safety shield should be clean. T F
5. Wheels that are out of balance may be used. T F
6. The spark arrester is not necessary if there is a glass safety shield. T F
7. When grinding a small piece of steel, "vise grips" are advised. T F
8. If there is a glass shield, eye protection is not required. T F

Chinese Version

安全测验

1. 工具架应调整到距离轮片1/3英寸 大
2. 在磨削不需常戴防护眼镜 大
3. 切断电源后在"off"(开)位置上时操作者便可离开 大
4. 安全罩要清洁 大
5. 不平衡的轮子尚可使用 大
6. 如有安全玻璃罩便不必用火花防止器 大
7. 磨削细小铜物时最好用VISE GRIPS钳子 大

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SAFETY SUGGESTIONS

1. Before starting, make sure that guards are free and will cover the blade at all times.

2. A push stick must be used on all material that would bring the hands within 2" of the cutter.

3. An assistant should help support long pieces.

4. Several light cuts are safer than one heavy cut.

5. Wear eye protection.

6. The board being jointed must exceed the minimum length established for that particular machine (check with instructor).
SAFETY QUIZ

1. It is possible for the guard to stick and not cover the cutter.  
   T  F

2. A push stick should be used when the hands could get close to the cutter.  
   T  F

3. Eye protection is not necessary when operating a jointer.  
   T  F

4. Permission should be obtained before using the jointer.  
   T  F

5. Stock shorter than 6" may be processed on the jointer.  
   T  F
Safetty Suggestions

1. Wear approved eye protection.
2. Remove jewelry, eliminate loose clothing and confine long hair.
3. Do not leave the machine until it has stopped.
4. A brush should be used to remove chips.
5. The chuck should be turned by hand before starting.
7. Stock should be balanced and secured before starting.
8. Operate at the correct speed for the job.
9. Handle chucks with care; keep hands away from moving parts.
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<thead>
<tr>
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<tbody>
<tr>
<td>1.</td>
<td>A brush should be used for removing chips.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>2.</td>
<td>The tail stock need not be secure to the bed.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>3.</td>
<td>The chuck wrench remains in the chuck when the machine stops.</td>
<td>T</td>
<td>F</td>
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<tr>
<td>4.</td>
<td>It is safe to turn machine by hand before starting.</td>
<td>T</td>
<td>F</td>
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<tr>
<td>5.</td>
<td>Measurements should be made while the machine is stopped.</td>
<td>T</td>
<td>F</td>
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**Chinese Version**

安全测验

1. 用刷子清除碎屑。 **是**
2. 尾座不需要紧在床身上。 **不是**
3. 研磨机停机时，底座应留在床体内。 **是**
4. 开动前用手转动研磨机是安全的。 **是**
5. 研磨机停止时便可以测量大小端面。 **是**
SAFETY SUGGESTIONS

1. Eye protection must be worn.
2. The tool rest must be close to the work when cutting tools are being used.
3. The cutting tools must be kept sharp.
4. Do not feel for smoothness of work while machine is running.
5. Work must be centered, balanced and secured.
6. The tool rest must be removed while sanding.
7. Examine setup before turning on power.
8. Shut off power while cleaning machine.
9. Long hair and loose clothing must be appropriately confined.

Chinese Version

安全提議

1. 戴護眼鏡
2. 單刀切刀時工具一定要靠邊邊
3. 切割工具一定要保持銳利
4. 單機時砂紙磨滑時工具要拿走
5. 長物一定要放在正中和平衡
6. 單砂紙機時工具要拿走
7. 單砂紙機時工具要拿走
8. 長物一定要放在正中和平衡
9. 長物一定要放在正中和平衡
SAFETY QUIZ

1. The speed of the machine is not important for safe operation. T F
2. A space of 1" is safe between the tool rest and the work. T F
3. Eye protection is not necessary during operation. T F
4. Dull tools may be used. T F
5. It is safe to feel for smoothness while turning. T F
6. The tool rest should be removed while sanding. T F
7. It is safe to turn work that is not balanced. T F
8. Long sleeves may be worn while operating. T F
9. The cutting tools should be held loosely. T F
10. The hair should be confined while operating the machine. T F

Chinese Version

安全测验

1. 机器的速度对操作之安全不重要。 是 否
2. 工具架与工作物之间1寸距离是安全的。 是 否
3. 操作时不必要戴防护眼镜。 是 否
4. 可以用钝的工具。 是 否
5. 在操作轻度移动时感觉滑动是安全的。 是 否
6. 在磨削时应把工具架移去。 是 否
7. 操作不平稳的物体是安全的。 是 否
8. 操作时可穿长袖衣服。 是 否
9. 磨砂时应戴手套。 是 否
10. 在接触工作时应戴防护镜。 是 否
Milling Machine

SAFETY SUGGESTIONS

1. Make adjustments and measurements only when the machine is at a complete stop.
2. Material being machined must be properly secured.
3. Make sure the cutter is rotating in the right direction. Feed against the cutter unless the machine is capable of climb cutting.
4. Handle cutters carefully as they are sharp.
5. Keep fingers a minimum of 6" from the cutter.
6. Take care to prevent jamming the vise or the work into the column, cutter, etc.
7. Start your own machine and remain with it until you have turned it off and it has come to a complete stop.
8. Never clean chips away from cutter while machine is running.
9. Eye protection must be worn.

Guard
Hand Feed Lever
Hand Feed Lever
Quill
Spindle
Table
Longitudinal Feed Handwheel
Knee Lift Screw
Head
Grip
SAFETY QUIZ

1. On long cuts it is permissible to leave the machine while on automatic feed. T F
2. Cutters should be stored loosely on the work bench. T F
3. Eye protection should be worn at all times. T F
4. Swarf chips can be wiped away with the hands. T F
5. The automatic rapid feed should not be used when the stock is closer than 6" from the cutter. T F
6. Handles should be disengaged when on automatic feed. T F
SAFETY SUGGESTIONS

1. Approved eyeprotection must be worn.
2. A "backer board" should be used when planing thin stock.
3. Do not force material through planer.
4. Do not remove chip accumulation while machine is running.
5. Do not stand directly behind the machine or in the line of kick back.
6. Do not look into the throat of the surfacer when it is running.
7. Be sure to select the proper speed and depth of cut.
8. The board being surfaced must exceed the minimum length established for that particular machine (check with instructor).
| Question                                                                 | T/F       | Answer
|-------------------------------------------------------------------------|-----------|--------
| 1. Instructor's permission is required to operate the machine.          | T         |        
| 2. Eye protection is required to operate machine.                      | T         |        
| 3. Chips may be removed while machine is running.                      | T         |        
| 4. It is safe to plane wood with loose knots.                          | T         |        
| 5. If material becomes stuck, it is safe to stop machine.              | T         |        
| 6. Line of sight should be through the throat of the machine.          | T         |        
| 7. Assistance should be obtained when planing long pieces of wood.    | T         |        

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| Question                                                                 | T/F       | Answer
|-------------------------------------------------------------------------|-----------|--------
| 1. 操作机器一定要得到教师批准                        | 是        | 否     
| 2. 操作机器一定要戴防护眼镜                        | 是        | 否     
| 3. 机器运转时可以清理屑末                      | 是        | 否     
| 4. 用刀去除梳木头是安全的                      | 是        | 否     
| 5. 如果材料卡在机器内，停止机器是安全的            | 是        | 否     
| 6. 视线应通过机器的喉部                        | 是        | 否     
| 7. 当削木头时要有人陪伴                        | 是        | 否     

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S-5.18
SAFETY SUGGESTIONS

1. Operate the press only when all guards are in place and properly adjusted.
2. Never reach for misprinted or dropped paper while the press is in operation.
3. Do not make internal adjustments while the press is in operation.
4. Do not clean the press while it is in operation.
5. The instructor should determine the operating speed.
6. Never reach across the press while it is in operation.
7. When finished with the press, it must be clean and all paper, equipment and tools must be returned to proper storage.

安全建議

1. 當所有的護罩都裝好和調整好才開始操作印刷機
2. 印刷機時永不能取印版的錯誤的紙張
3. 印刷時不要作內部調整
4. 印刷時不要清理
5. 教師在決定操作速度
6. 印刷時時不要伸手過機器
7. 印刷完後，一定要清理所有紙張髒物和工具一定要好好放回原位

图示:

- SAFETY COVER
- SINGLE LEVER HANDLE
- MASTER CYLINDER
- HANDWHEEL
- VACUUM FEED SWITCH
- PAPER RECEIVER
- MACHINE SWITCH
- INK FORM ROLLER CONTROL KNOBS
SAFETY QUIZ

1. The gears need not be covered while the press is in operation. T F
2. The machine must be stopped before misprinted or dropped paper is removed from the press. T F
3. Final adjustments may be made while the machine is running. T F
4. You should be alert to keeping others away from the press while it is in operation. T F
5. It is safe to reach across the press when it is operating. T F
SAFETY SUGGESTIONS

1. Wear approved eye protection.
2. Check to see if belt is properly installed and in good condition before starting.
3. Start sander above work; let rear of belt touch first.
4. Keep the electrical cord clear and the dust bag away from the sander belt.
5. Lift sander off the work before stopping.
6. Wait until belt is completely stopped before placing sander on bench.
7. Empty dust bag daily into proper waste container.
BELT SANDER

SAFETY QUIZ

1. Eye protection is required when using this machine.
   T  F

2. You should have a firm grasp on the sander before starting.
   T  F

3. The sander should rest on the work when starting.
   T  F

4. A wood sander should not be used on steel.
   T  F

5. This machine should be examined before starting.
   T  F
SAFETY SUGGESTIONS

1. Wear approved eye protection.
2. Remove jewelry, eliminate loose clothing and confine long hair.
3. Use properly secured and adjusted guards at all times.
4. Adjust the guide and guard to within 1/4 inch of work.
5. Remove scrap only when machine is stopped.
6. Avoid backing out of a cut (kerf).
7. Keep hands and fingers in such a position that there is no danger of their slipping into the blade. Hold work piece on either side of the cutting line. Use a push stick where necessary.
8. Do not leave the machine until it has stopped.
9. Consult with your instructor before cutting large or irregular shaped pieces.

CHINESE VERSION

安全建議

1. 戴合適的護眼鏡。
2. 除去手錶和衣物, 未留長髮。
3. 常規檢查保護蓋和調整好護罩。
4. 把指標和護罩調整到與作業 1/4 倍地方。
5. 只在機器停止後才清理屑末。
6. 避免中途生切片。
7. 手指手指應在一固定位置避免滑向刀片, 在切割時適當著作業。
8. 機器未停止時不要離開機器。
9. 在大切片或不定形之材料時需在教練指導。
SAFETY QUIZ

1. It is safe to tilt the table for cutting bevels. T F
2. The lower band wheel does not require a guard. T F
3. The saw should be stopped by forcing a piece of wood against the blade. T F
4. The blade guard should be adjusted to about 1/4" from the work. T F
5. It is safe to use the fence for cutting several pieces of wood to the same length. T F
6. The hands should come no closer than 2" from the blade. T F
7. The blade guides should be adjusted tight against the blade. T F
8. Instruc. r's permission is required to operate a band saw. T F
9. Adjustments should be made with the power off. T F
10. Eye protection is not required when operating a band saw. T F

11. If the work does not cut easily you should:
   (a) speed up the blade T F
   (b) push harder T F
   (c) replace the blade T F
   (d) check with your instructor T F

Student Name ____________________________
Class ____________________________
Date __________ Grade ____________
SAFETY SUGGESTIONS

1. Make sure that telescoping guard returns automatically to cover the blade after each cut.
2. Do not set saw down until blade stops.
3. Eye protection must be worn while using saw.
4. If the saw blade binds or smokes, stop cutting immediately.
5. Make sure the power cord is clear of the blade.
6. Be sure the material you are cutting is adequately supported.
7. Remove tie, rings and watch, and roll up sleeves.
8. Check the base setting for the proper depth of cut.

Chinese Version

安全建議

1. 材料切割完畢後，請務必將活動護罩盖回刀片上。
2. 直至刀片已停止時才放下旋鈕。
3. 使用時一定要戴上護目鏡。
4. 如發現刀片卡住或有異常，立刻停止切割。
5. 確定刀片已完成切割後，方可放下旋鈕。
6. 確保切割中的材料正確地支撐著。
7. 除去領帶、戒指、銬鍊，捲起衣袖。
8. 檢查機底之正確切的深度。
PORTABLE CIRCULAR SAW

SAFETY QUIZ

1. Permission should be obtained before operating this machine.  
   T  F

2. The guard can be wedged so that it will not be operable.  
   T  F

3. Eye protection is not necessary when using this machine.  
   T  F

4. You should not set the saw down until it has completely stopped.  
   T  F

5. The saw blade should extend about 1/8" beyond the thickness of the material being cut.  
   T  F
Radial Arm Saw

SAFETY SUGGESTIONS

1. Be sure that the saw travels easily on the arm.
2. Be sure that the blade will not extend beyond the front of the table.
3. Before starting make sure that the guard telescopes properly.
4. Make sure that the blade is stopped before leaving the machine.
5. Make sure that the material being cut is tight against the fence.
6. Eye protection must be worn while operating this machine.
7. Be sure the saw returns to the rear of the table at the completion of the cut.

Chinese Version

安全建議
1. 確保鋸片在臂上運轉自如。
2. 確保刀片不會伸過臂的前面。
3. 開動前確保護罩正確地裝上。
4. 翻開護罩前確保刀片已停止。
5. 確保被切物緊貼於板上。
6. 操作時一定要戴護目鏡。
7. 確保在完成斜切後鋸片回到臂的後面。
SAFETY QUIZ

1. Eye protection is not necessary except when ripping.  T  F
2. You may leave the machine as soon as you have pushed the "off" switch.  T  F
3. The guard must be in place when ripping.  T  F
4. The saw blade may extend beyond the table.  T  F
5. The blade should be installed so that in cross cut position the teeth at the bottom of the blade point away from the operator.  T  F
6. When ripping, one hand must hold the material and the other hand operate the saw.  T  F
7. In cross cutting, the saw should automatically return to the rear of the radial arm upon the completion of a cut.  T  F

安全测验

1. 除非锯割否则不同戴防护眼镜。 是 否
2. 启动后“OFF”按钮即可离开机器。 是 否
3. 锯割时护罩一定要定位。 是 否
4. 锯片可以伸出刀刃。 是 否
5. 刀片安装好后在横切位置时刀片不朝向操作者。 是 否
6. 在横切时,锯片自动回到旋臂末端。 是 否
SAFETY SUGGESTIONS

1. Eye protection must be worn while operating this machine.
2. Make all adjustments before turning on scroll saw.
3. Lower the hold-down so that the spring fingers bear lightly on the work.
4. The danger area is within the "line of cut". Hold work piece with both hands on either side of the "saw line".
5. Shut off power and clean the machine before you leave it.
6. Avoid overloading the machine by feeding the stock too fast.
7. Avoid pinching the blade by turning too sharply.

Chinese Version

安全建議

1. 操作時一定要戴護眼鏡．
2. 在輕動滑鋸前調整機器．
3. 放低穩定器使彈簧輕輕貼在待作物上．
4. 動作中是危險地帶用雙手扶著待作物在鐵軌進退．
5. 在離開機器前關掉馬達清理機器．
6. 避免輸入過快過猛，以使機器負荷過重．
7. 避免轉動得過厲害，便輕著刀具．
SAFETY QUIZ

1. If the blade pinches in the kerf do not stop the machine. T F
2. Eye protection must be worn. T F
3. It is not necessary to have the flat side of the stock next to the table. T F
4. Fingers should be kept away from the line of cut. T F
5. Adjustments may be made while the saw is running. T F
6. The hold-down should bear lightly on the work. T F

1. 假如刀片插在缝隙不要停止机器. 是 否
2. 一定要戴护眼镜.是 否
3. 不必要使材料的平面附於桌上.是 否
4. 手指要离开切线.是 否
5. 寸度在转动中时可调整机器.是 否
6. 固定器应轻轻放在材料物上.是 否
OBTAIN PERMISSION FROM THE INSTRUCTOR
BEFORE USING THIS MACHINE.

**Table Saw**

**SAFETY SUGGESTIONS**

1. Wear approved eye protection.
2. Remove jewelry, eliminate loose clothing and confine long hair.
3. Use properly secured and adjusted guards at all times.
4. Make all adjustments and remove scraps with the machine completely stopped.
5. Select proper blade and set at correct height (1/8 inch above wood).
7. Stand to the side - not in line with the blade.
8. Make sure blade is installed with the teeth pointing in the proper direction.
9. A push stick should be used when the hands come within 3 inches of the blade.
10. Use the rip fence for ripping and miter gauge for crosscutting.
11. Stop the machine, lower blade below table, and clean up scraps when completed.
1. The fence should always be used. 

2. The guard is not always necessary. 

3. When ripping it is best to stand directly behind the blade. 

4. The saw blade should be adjusted so that the teeth clear the thickness of the material by the depth of the teeth. 

5. A helper or roller should be used when ripping long pieces. 

6. A push stick is necessary when ripping narrow stock. 

7. A helper should be used when ripping long pieces. 

8. Eye protection should be worn when using a table saw. 

The saw blade should be adjusted so that the teeth clear the thickness of the material by the depth of the teeth.
SAFETY SUGGESTIONS

1. Wear approved eye protection.
2. Make adjustments and measurements only when the machine is at a complete stop.
3. Securely mount the work piece in the holding device.
4. Make certain that the ram and head will clear the work and holding devices.
5. Keep hands and fingers a minimum of 6 inches from the cutting tool and all other moving parts.
6. Avoid laying tools on the machine.
7. Avoid standing directly in front of or behind the ram.
8. Make sure machine comes to a complete stop before leaving it.
9. Never remove chips while the machine is in motion.
10. Return the machine to normal and all tools and equipment to the proper storage place.

Metal Shaper
METAL SHAPER

Student Name_________________________
Class_________________________
Date__________________Grade__________

SAFETY QUIZ

1. It is permissible to use compressed air to remove chips while the machine is running.  
   T  F

2. Eye protection must be worn.  
   T  F

3. A heavy cut may get the job done more quickly but also could be unsafe.  
   T  F

4. Chips may be removed while the machine is running.  
   T  F

5. All clearances should be checked before the ram is set in motion.  
   T  F

6. All set-ups should be approved by your instructor.  
   T  F

7. All clearances should be checked before the ram is set in motion.  
   T  F

8. All set-ups should be approved by your instructor.  
   T  F
Metal Squaring Shear

SAFETY SUGGESTIONS

1. Check setup and machine before operating.
2. Never surpass the capacity of the machine.
3. Feed and operate from the front or the operator's position.
4. Always keep your fingers away from the pressure bar and blade, a minimum of 4 inches.
5. Keep the foot that is not being used out from under the treadle.
6. Allow small pieces to drop; do not attempt to catch them.
7. Remove burrs before working; gloves or pads are recommended for handling sheet metal, especially large pieces.
8. Place scraps or trimmings in metal waste container and return machine to normal position.
9. Whenever two people are needed to operate the shear, one shall be the operator, the other the helper.

Chinese Version

安全建議

1. 在操作前檢查裝置及機器
2. 永不超過機器的容量
3. 輸入及操作時由操作者的前方或位置進行
4. 手指要保持4吋以上5公分與刀片的距離
5. 不要把置腳的一只置於剪刀下
6. 剪碎小塊的庫比當作，不要試圖去撿它
7. 工作前先清理粗細孔鏤在操作會傷手，尤其是大的金屬片，最好用手套
8. 完工後將碎屑放入廢物箱及機器放回原來位置
9. 當情況需要二人操作剪刀時，一人負責操作為一人為助手
SAFETY QUIZ

1. Feed and operate from the treadle side of the machine only.  T F
2. It is permissible to let small pieces drop into a box as they are cut.  T F
3. Two students may operate the shear together.  T F
4. For some projects the guard can be removed.  T F
5. The foot treadle should be so arranged that there is a 2” floor clearance at the bottom of a stroke.  T F

METAL SQUARING SHEAR

Student Name
Class
Date
Grade

1. 輸入和操作時只站在腳踏板處
2. 剪割時小塊碎屑可以掉進箱子中
3. 兩個學生可以共同操作剪床
4. 有些動作可以移去護罩
5. 腳踏板要離地2 吋
SAFETY SUGGESTIONS

1. Remove sharp burrs and edges from sheet metal before attempting to work it in the machines.

2. Never attempt to bend, roll, crimp, head, etc., metal which is heavier than the capacity of the machine.

3. Keep hands and fingers clear of moving parts.

4. Never work more than one thickness of metal at one setup.

5. Avoid slamming or dropping the handles of the machine.

6. Be careful that moving parts or metal do not strike others.

7. Take care not to place hands in a position that will allow them to slip into the rolls, jaws, etc.
SAFETY QUIZ

1. The infeed rolls of a roll machine are dangerous to the operator's hands.  
   T  F

2. Sheet metal machines can be damaged by overloading.  
   T  F

3. Sharp burrs and edges should be removed before attempting to place in the machine.  
   T  F

4. Fingers must be kept clear of moving parts.  
   T  F

5. Quarter inch mild steel stock can be formed on the sheet metal machine.  
   T  F

Chinese Version

1. 滚轴输入口对操作员的手是危险的。 
   是  非

2. 过载将损坏金属板。
   是  非

3. 在尝试操作机器前先清理粗糙边缘。
   是  非

4. 手指不要靠近转动中的零件。
   是  非

5. 金属板材可以制成1/4英寸的钢。
   是  非
SAFETY SUGGESTIONS

1. A welding helmet must be worn when welding.
2. Proper ventilation must be available.
3. Goggles must be worn when chipping slag.
4. Others in the area must be warned prior to striking an arc.
5. Gloves and proper clothing must be worn when welding.
6. Closed containers should not be welded without the instructor's permission.
7. Do not stand in wet areas while welding.
8. Screens to protect others must be in place before welding is started.

ArcWelder

Safety Suggestions

1. A welding helmet must be worn when welding.
2. Proper ventilation must be available.
3. Goggles must be worn when chipping slag.
4. Others in the area must be warned prior to striking an arc.
5. Gloves and proper clothing must be worn when welding.
6. Closed containers should not be welded without the instructor's permission.
7. Do not stand in wet areas while welding.
8. Screens to protect others must be in place before welding is started.

Chinese Version

安全建议

1. 焊接时一定要带面罩。
2. 要有关适合的通风设备。
3. 打击落渣时，一定要带护目镜。
4. 开始焊接前，必须在工作区。
5. 不要私自焊接，不告诉要。
6. 封盖的容器，未得教师准许不得焊接。
7. 焊接时不要站在或滑的地方。
8. 焊接时，要戴上保护别人的面罩。

122
SAFETY QUIZ

1. You should warn anyone nearby when you start to weld.  
   T  F

2. Goggles as well as a welding hood should be available before you start to weld.  
   T  F

3. A closed container is dangerous to weld.  
   T  F

4. Gloves are not necessary when welding.  
   T  F

5. It is dangerous to weld without proper ventilation.  
   T  F
SAFETY SUGGESTIONS

1. Do not weld galvanized metal without proper ventilation.
2. Do not allow oil to come in contact with hoses or equipment.
3. Gas bottles must be erect and secure at all times.
4. Protective goggles and spark-resistant clothing must be worn when welding.
5. Do not weld or cut on a closed container without instructor's approval.
6. Confine all cutting and welding to the designated area in the shop.
7. Turn off torch valves when finished with equipment.
8. Keep the cylinder caps on the bottles when not in use.
9. Turn off gas and oxygen at tanks or stations at the end of class session.
10. Bend the end of long welding rods to identify hot end and to reduce potential exposure to eye injury.

Oxy-Acetylene Welder

1. Do not weld galvanized metal without proper ventilation.
2. Do not allow oil to come in contact with hoses or equipment.
3. Gas bottles must be erect and secure at all times.
4. Protective goggles and spark-resistant clothing must be worn when welding.
5. Do not weld or cut on a closed container without instructor's approval.
6. Confine all cutting and welding to the designated area in the shop.
7. Turn off torch valves when finished with equipment.
8. Keep the cylinder caps on the bottles when not in use.
9. Turn off gas and oxygen at tanks or stations at the end of class session.
10. Bend the end of long welding rods to identify hot end and to reduce potential exposure to eye injury.

安全建議

1. 無當當通風設備不得燒焊鋅鋅的金屬。
2. 不要輕油類與鋼管或器具接觸。
3. 常常裝好安全鏡。
4. 燒焊時一定要戴護目鏡和防火衣。
5. 未教師之批准不得燒焊或切密封的容器。
6. 本工作指定之地方操作切或熔焊。
7. 在上完設備後關掉汽油門。
8. 燒不用時要順便裝好。
9. 每堂上完時關掉氣和氧氣。
10. 將長焊條等煮去證明熱焊以減少眼睛可能受到傷害的機會。
SAFETY QUIZ

1. Gas bottles may be laid on the floor when not in use.
   T  F

2. Closed containers are not hazardous to weld or repair.
   T  F

3. The cylinder caps should be placed on all bottles when not in use.
   T  F

4. Eye protection must be worn for all welding, cutting and chipping operations.
   T  F

5. The equipment should not be wiped down with oily rags.
   T  F
OPERATION CHECK LIST
OXY-ACETYLENE WELDER

1. Obtain permission from the teacher to use oxy-acetylene welder.

2. Adjust welder for operation in following sequence:
   a. Inspect regulator's adjusting screws to insure that they are all the way out (counterclockwise).
   b. Open oxygen cylinder (green) valve slowly.
      (wide open -- stand to one side)
   c. Open acetylene cylinder (red) valve (4 to 5 turn)
   d. Open the torch oxygen valve one turn.
      (1) Turn oxygen regulator valve adjusting screw until proper reading is obtained.
         (See chart for tip being used.)
      (2) Turn off torch oxygen valve.
   e. Turn the acetylene regulator adjusting screw in slowly until correct reading is obtained for tip being used.

3. Lighting torch procedure:
   a. Turn torch acetylene valve 1/16 of a turn, then ignite acetylene gas coming from tip with spark lighter.
   b. Readjust the acetylene regulator adjusting screw until the correct reading is obtained.
   c. Turn acetylene torch valve on slowly until flame jumps away from tip, then slightly reduce the fuel supply to bring the flame back to the tip.
   d. Adjust torch oxygen valve to obtain neutral flame.

Do I understand the following operating instructions?

1. I must wear welding goggles when gas welding. Yes No
2. I must never lay down a lighted torch. Yes No
3. I must never use acetylene gas at a pressure greater than 15 lbs. per square inch. Yes No
4. I must be careful not to burn hoses. Yes No
5. I must replace goggle, hoses and torch in proper places and clean up area when I am through welding. Yes No
6. I must have teacher check my set up before lighting torch. Yes No

STUDENT'S NAME ___________________________ TEACHER'S INITIALS ________________________

1. 操作氧乙炔熔焊機前得教師准許。
2. 操作氧乙炔熔焊機前得教師准許。
3. 操作氧乙炔熔焊機前得教師准許。
4. 操作氧乙炔熔焊機前得教師准許。
5. 操作氧乙炔熔焊機前得教師准許。
6. 操作氧乙炔熔焊機前得教師准許。

明白 不明白