ADVATEK SYSTEMS INC.

WORKPLACE HEALTH AND SAFETY PROGRAM

SECTION 1

OHS - OVERVIEW

UPDATED Dec 01 2016

EFFECTIVE AS OF JUNE 29 2012

APPROVED BY TERRY LEBLANC x_____

GENERAL MANAGER ADVATEK SYSTEMS INC.

SECTION 1 GENERAL INFORMATION

1.0 Policy

Advatek Systems Inc. strives to provide a safe and secure workplace for all of its employees and customers. Management is responsible to provide proper training to all employees as well as ensuring all contractors are also compliant to our safety standards. Employees are responsible to ensure they under stand the safety standards and strive to maintain a safe and secure workplace.

1.1 TRAINING

A. Training will be provided to all employees of Advatek Systems by the designated Work Place safety trainer. This competent person will be assigned each year by the general manager of Advatek Systems Inc.

B. All employee of Advatek Systems Inc. must under go safety training as outlined in this program before been permitted to work.

C. Failure to complete the required training as described in this program will result in management actions been taken

D. All employee certificates, tickets, and violations will be given to the employee and kept in their personnel file & safety file as proof training.

E. All Employees must have the following training: General Safety & WHMIS

1.2 PERSONAL PROTECTIVE EQUIPMENT(PPE)

Advatek Systems Inc. will provide the required PPE required for your jobs. It will be the responsibility of the employee to report any defective PPE to the General Manager. New PPE will be provided to the employee upon request.

1.3 FIRST AID

Advatek Systems Inc. will maintain an employee on staff at all time who is first aid qualified. These employees can request extra first aid training & equipment so as to better provide there services. See Section 8 for full details.

1.4 VIOLATIONS

A. Any Advatek Systems Inc. employee who notices a safety issue is required to act to stop & prevent this issues.

B. Employees of Advatek Systems will be subject to violation write ups should they be caught performing unsafe work practices.

C. The following are the disciplinary steps: recorded verbal warning, recorded written warning, recorded written infraction (requires re-training in area of violation), personal management review & action.

1.5 CONTRACTORS

A. Contactors must agree to adhere to the standards set forth in the Advatek Systems Safety program

B. Failure to comply once on site will result in penalties been applied and possible loss of future work.

C. Contactor must hold valid Workers Compensation coverage

D. Contractors must have a Health and Safety program inplace that matches or exceeded the Advatek System standard prior to selection

E. Contractors must provide statistics concerning injuries/compensation worksheets for review prior to selections

F. Contractor with out their own Health and Safety procedure must either get one or take the Advatek Systems Safety courses required for the job.

G. Contractor must have there safety manual at all times for reference

H. All contractors must have a guided orientation of the work site, this will point out any specific hazards and any other restrictions or concerns the customer may have.

I. Contractors must ensure that all employees are aware of the 0% tolerance for drugs or alcohol, this is to supplement or improve upon any policy of the end customer

J. Contractors must be included in any meetings where their work will be discussed so as to ensure the safety of all involved.

K. All injuries or accidents must be reported immediately and all reports will be passed along the end customer

L. Once a job is completed a post job meeting will be held, at this time any penalties for safety violations will be tallied and the overall job satisfaction will be discussed.

M. Contractors with there own OHS program will have to submit their program for review by Advatek Systems Inc.

N. Advatek Systems Inc. will communicate the “Owner Client’s” drug and alcohol policy (3.17) to any contractors

O. Advatek Systems Inc. will communicate any infractions and incidents to the “Owner Client” and assist and participate in any investigation.

1.6 REPORTING

A. All incidents must be logged and reported immediately. Also any close calls must also be reported

B. All incidents will be reviewed and investigated

C. During the cause of the investigation the root cause of the incident is to be determined also at the time of reporting the employee must attempt to ascertain what he believed to be the root cause.

D. The review/investigation of the incident must include corrective action to be taken to avoid another similar injury. Any immediate corrective action taken post incident must also be recorded as to best help reduce the occurrence

E. At least 1 member of the investigating team MUST have attended the NB OHS Joint Health and Safety Committee training. The remaining members must have received in house training / literature on how to conduct an investigation

F. Once the investigation is complete the OHS manual is to be updated as needed, the training materials is to be adjusted and the section test is to be re-administered to all employees to ensure understanding of the new rules

1.7 TERMS

For the entirety of this program the term **employee** can mean owner, employee, contractors, or guests that are the responsibility of Advatek Systems Inc.

1.8 Rights

Advatek Systems follows the following right to refuse process.

The New Brunswick Occupational Health & Safety Act

This legislation establishes an Internal Responsibility System (IRS), making occupational health and safety a shared responsibility among all individuals involved. This shared responsibility considers each person's authority and ability. If a person in the workplace sees a hazard and can act to eliminate it, then they must do so. If they are unable to address the hazard, then they must report it to someone who can—someone with the authority to ensure the hazard is addressed

Specifically, the purpose of the legislation is to prevent accidents and injuries related to, arising from, or occurring during employment. The legislation is grounded in three fundamental rights for employees:

The right to know – Employees have the right to be informed about health and safety hazards they may be met with at their workplace.

The right to participate – Employees have the right to take part in decisions that may affect their health and safety.

The right to refuse dangerous work – If an employee believes that the use or operation of equipment, machinery, or any condition in the workplace poses a danger to themselves or others, they have the right to refuse to perform that work. If an employee is instructed to do work they believe to be dangerous to themselves or others in the workplace, they can refuse to do the work. If an employee refuses to do the work, they must:

Immediately report to a supervisor that they refused to do the work.
If the problem is not fixed to the employees' satisfaction, report it to their safety representative or committee representative.

If the problem persists, report it to WorkSafeNB for an Officer to investigate.
If you disagree with the officer's decision, you have a right to appeal to WorkSafeNB's chief compliance officer.

The employer or supervisor has the right to temporarily reassign an employee who has refused unsafe work to perform other work.

An employer or supervisor may also assign another employee to perform the work, but only after advising the other employee of the work refusal and reasons. If another employee accepts to carry out the work, WorkSafeNB consider the work refusal concluded.

There will never be repercussion for any safety concerns.

All right to refuse incidents will be documented for review with safety team.

ADVATEK SYSTEMS INC.

WORKPLACE HEALTH

AND

SAFETY PROGRAM

SECTION 2

TRAINING

SECTION 1 GENERAL INFORMATION

1.0 GOAL

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1.1 TRAINING

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B. All employee of Advatek Systems Inc. must under go safety training as outlined in this program before been permitted to work.

C. Failure to complete the required training as described in this program will result in management actions been taken

D. All employee certificates, tickets, and violations will be given to the employee and kept in their file as proof training.

E. Covered topic will be: General Safety, Ladder Safety, Fall Arrest, WHMIS & Power Lift Trucks

1.2 PERSONAL PROTECTIVE EQUIPMENT(PPE)

Advatek Systems Inc. will provide the required PPE required for your jobs. It will be the responsibility of the employee to report any defective PPE to the General Manager. New PPE will be provided to the employee upon request.

1.3 FIRST AID

Advatek Systems Inc. will maintain an employee on staff at all time who is first aid qualified. These employees can request extra first aid training & equipment so as to better provide there services.

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SECTION 2 TRAINING

2.0 TOPICS

The following topics will be covered by the Advatek Systems Inc. Work Place Safety Trainer:

- General Safety (ALL EMPLOYEES)
- WHMIS Training (ALL EMPLOYEES)
- Ladder Safety (ALL EMPLOYEES)
- Fall Arrest Safety (ALL SERVICE EMPLOYEES and ANY OTHER EMPLOYEES WHO REQUIRE IT)
- Power Lift Truck Safety (ALL LIFT OPERATORS)

2.1 TRAINING

Training will be conducted in two parts.

A. The first part will be done in the classroom and the employee knowledge of the topic will be validated through means of a written test. Advatek Systems Inc. requires a final mark of 100% to pass.

B. The second part will be conducted on site while the employee is working. As they demonstrate their understanding of the program either through constructed demo training on live on site training their tickets will be updated

2.2 VERIFICATION

Random spot checks will be performed by the Work Place Safety Trainer or their designated representative. Advatek Systems Inc employees must be able show their Work Place Safety tickets when asked for them

2.3 ENFORCEMENT

Any violations will be written up on site as they are found.

2.4 DOCUMENTED CERTIFICATES & TICKETS

Printed samples of the certificates and tickets are on the following pages.

2.5 DOCUMENTED TRAINING

Printed copies of the covered training on the following pages.

2.6 COMPREHENSION TESTING

Printed copies of the comprehension testing on the following pages.

ADVATEK SYSTEMS INC.

WORKPLACE

GENERAL SAFETY RULES

SECTION 3

Updated Dec 01 2016

ADVATEK SYSTEMS INC.

GENERAL SAFETY TRAINING

The following are the accepted safety rules that will be enforced at all times when at the office or on a worksite. These rules are the basis for working safely at Advatek Systems Inc. While on a customers site you will adhere to their safety rules so long as it does not violate any of the basic Advatek Systems Inc. safety rules. These rules are above and beyond any other regulations. NB Ocupational Health and Safety can be found online at **http://laws.gnb.ca/en/showdoc/cs/O-0.2/ga:s_51**

3.1 CLOTHING

All employees will ensure that their clothing presents no danger to them selves. All shirts will be tucked in and pants should fit securely or be secured using a belt. Shoe & boot laces will be tied at all times.

3.2 FOOT WARE

All service personnel will wear at all times CSA approved work boots or shoes. These need to be of the steel toe or carbon fiber variety. **Shoe & boot laces will be tied at all times.** Other office staff are permitted to where their own appropriate foot wear to work so long as they remain out of the service areas.

3.3 EYE PROTECTION

Appropriate CSA eye protection must be worn when preforming duties that would affect ones eye sight. The can include but are not limited to Grinding (Bench or portable), application of chemicals that not use of safety glass is required, welding, using a burning torch. Please follow manufactures directions.

3.4 EAR PROTECTION

Appropriate ear protection will be worn when operating equipment who noise level exceeds acceptable levels. Some activities include but are not limited to: Grinding, drilling metal. Please follow manufactures directions. At 85db Advatek Employee need to wear Ear Protection

3.5 HEAD PROTECTION

Appropriate CSA head protection will be worn at all times when working above your head or when their is a chance that tools, debris or other items may fall onto ones head. The head protection should be maintained at all times, it should also be discarded if subjected to a hit that causes cracks or damage to any part of the equipment. Please follow manufactures directions.

3.6 FIRST AID

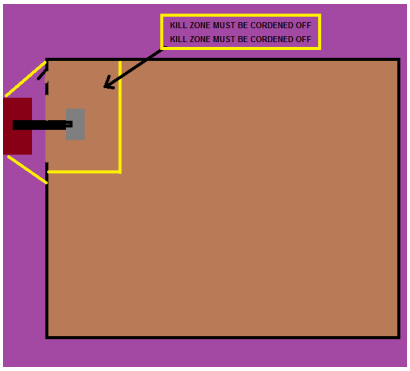
All employee will be aware of the location of the First Aid kit and the designated First Aid responders on staff. Electrical tape and paper towel is not considered appropriate first aid. See Section 8 for full details.

3.7 TRIP HAZZARDS AND CLEAN WORKSPACE

Employees will ensure that when they leave a work site that it be clean and free of hazards that may cause injury due to trips or falls. Regardless of the rush placed on the employee they shall ensure a clean work environment around walking zones. The safe walk zones in the shop must be designated by yellow paint

3.8 BOOM TRUCK OPERATION AND SAFETY

The operator of the truck is responsible of enforcing all safety requirement when employees are around his truck. Advatek Systems Inc requires the following above and beyond any regulated safety requirements. Employees must wear, a hard hat, safety shoes & reflective vest. If the work is to be done in an area where other workers are working the KILL ZONE around the boom must be cordoned off or all employees in the affect zone must wear the appropriate gear. The boom truck operator is required by Advatek Systems Inc. to wear a safety vest at all times when outside the truck while in use. See Section 3.22 for more information on operation of cranes, hoists and lifts



3.9 UNUSUAL WORK PLACE CONDITIONS (behavioral based)

Employees must consider what they are doing at all times if an action of work would be considered a chance for injury to themselves or another employee they should take precautions to protect themselves and the public.

A cordoned off safety zone should be used, as well as lift supports should be under the suspended scales. If the scales were to fall serious injusty to the legs could occur

4.10 LIFTING

91-191 Section 52

“Where the health or safety of an employee handling an object or material may be endangered, an employer shall ensure that

(a) Adequate and appropriate equipment is provided to the employee and is used by the employee for lifting and moving the object or material, and

(b) The employee is instructed as to the appropriate method of lifting and moving objects and material.”

3.11 OPERATION OF COMPANY VEHICLES

While operating an Advatek System Inc. Company vehicle the driver and passengers, both to be refered to as occupants from here on in, will obey all laws of the area they are operating with in. Strict attention is to be paid to the following:

a. Drivers must have their foot wear on correctly this includes tied laces.

b. Occupants **MUST** wear the seat belt at all times when traveling in a company vehicle

c. Drivers are **NOT** permitted to use any electronic hands on device such as cell phones, GPS, camera while driving or even stopped in traffic. This is regardless of if the local laws allow this.

d. Drivers are permitted (as long as the local laws allow this) to use a hand free device for using the phones.

e. Drivers must perform a walk around inspection of their vehicle each morning. Any damages or defects must be reported to the General Manager via EMAIL, as this create a paper trail. Please report registrations & safety stickers 1 month before they are due. When sending the email in the subject line use VEHICLE INSPECTION 'PLATE#' ISSUE.

f. **ANY** items in the box of company trucks **MUST** be secured and stowed. If you do not have correct tie downs and straps to secure the load then it is your responsibility to obtain these before moving the vehicle. When transporting boxes to a customer site the use of a tarp covering the boxes and secured to the truck will count as securing the load.

g. Employees are encouraged to back in company vehicles, or have a vehicle facing out position when parking.

h. Employees are required to use the park brake when parking company vehicles

i. All Company vehicles must have their ADV-OHS-0007(Fleet) or ADV-OHS-0008(Comercial) completed by the end of the first week of each month

3.12 Occupation Heath and Safety Act & Regulations

All Advatek Systems Inc employees will be informed and trained in the OHS Act & Regulations. Using the available online materials provided at **http://laws.gnb.ca/en/showdoc/cs/O-0.2/ga:s_51**

3.13. SCAFFOLDS

Advatek Systems Inc employees are not trained to setup scaffolds, see section 3.21 for more details

3.14 WHMIS

All Advatek Systems Inc employees shall be given WHMIS training regardless of working condition. The MSDS for any controlled product at Advatek Systems will be kept in the MSDS binder located in the Service Office and up front. MSDS sheets need to be obtained for all controlled products.

3.15 VEHICLE BACK IN POLICY

Advatek Systems Inc encourages that all employee back in any company vehicles at all customer site. As en extra amendment it is required to be done at any mine site. When arriving on site employees are required to check if there is a back in policy

3.16 CHEMICAL AND BIOLOGICAL HAZARD

Employees at Advatek System Inc under normal circumstances NOT exposed to Chemical or Biological Hazards. However in the case their work does take them into such a scenario the following is to be done.

a. Address with the customer to see if they have existing rules for working in the affected area and if so follow their procedures, they must also ensure they are aware of the existing of clean up and emergency equipment.

b. Air sampling will take place to ensure safe operating limits in these zones, or current up-to-date reports from the customer site are acceptable.

c. Respirators will be used and available should they be needed if engineering controls are not available

d. Should a spill or accidental release occur the Employee must notify the customer immediately and allow the customer to perform the clean up. Advatek Systems Inc. does not permit Employees to clean up Chemical or Biological spills as they are not trained to do so.

3.17 DRUG AND ALCOHOL POLICY

Employees of Advatek Systems Inc at any time must abide by the following items

a. All employees are notified upon employment that drug and alcohol testing may occur randomly

b. This policy is delivered as part of general orientation and OHS training.

c. A 0% Tolerance to Drugs and Alcohol will be enforced and result in immediate management action

d. No Alcohol is to be consumed during office hours

e. Employees must never work or drive if they feel they are still under the influence of alcohol

f. Use of high end pain killers or other prescribed drugs that have an affect on perception or reaction times must be reported to management via email

g. Employees must take an Alcohol or Drug test if requested

h. Employees may be required to take an Alcohol or Drug test before returning to work after any incident

i. Advatek reserves the right to ask potential employees to take an Alcohol or Drug test

j. Use of **ANY** illegal narcotics is prohibited regardless of popular belief

k. Employees are forbidden from taking any intoxicating substances to work / job site

Advatek will only request a Drug or Alcohol test if the employee is

A. Exhibiting unusual behaviour normal for that employee

B. Reports of or smell of intoxicating substances on the employee

C. Employee caught in the act of consumption of intoxicating substances

D. Required as part of Customer safety program

Supervisors are instructed to be on the lookout for symptoms of impairment such as slurred speech, unusual behaviour out of character, flushed appearance. Should you suspect impairment then remove the employee from the work site and contact management. Do not get into a fight with the employee if they become aggressive the police **must** be called.

3.18 FIRE SAFETY

Advatek Systems Inc will provide a workplace that minimizes the risk of a fire and provide the mean to notify and fight the fire.

a. Fire Extinguishers will be available in each occupied work zone for easy access

b. Fire Extinguishers will be mounted on a RED mount that is placed on a wall easily accessible

c. Fire Extinguishers will be mounted on all lift trucks

d. Fire Extinguishers will be available in all company vehicles

e. Fire Extinguishers must be inspected each month by an Advatek Employee using the Form OHS-318-A this form is to be kept in the OHS cabinet for reference purposes

f. Fire Extinguishers must be inspected each year by a representative of the Fire Department

g. All rags or paper towel used to clean up combustible spills must be disposed of promptly and not be allowed to sit around

Fire & Smoke Detection Gear

If you are using a monitored service you should ensure that all systems are working at least once per year. If you are using a stand alone monitor then the below items must be observed

- Working Smoke & Fire Detection equipment is to be maintained and checked once per month and recorded on Form OHS-318-A, the forms are kept in the OHS cabinet for reference purposes

3.19 HOT WORK (Welding, Soldering and Cutting)

All Information pertaining to Hot work has been moved to **Section 16—Hot Work**

3.20 POWERED MOBILE EQUIPMENT (PME)

Advatek Systems Inc has the following policies pertaining to the operation of powered mobile equipment

a. Only employees who have been trained and have proven competent in the operation of powered mobile equipment shall be permitted to operate it

b. Prior to the operation of the equipment for the first time that day the employee shall perform a walk around inspection to ensure that the equipment is safe and ready for operation.

c. Seat belts must be worm while operating PME

d. When leaving the equipment unattended, the operator shall park it on level ground, set the brake, lower the blades and bucket or safely block them, disengage the master clutch, stop the engine, and remove the key.

3.21 ELEVATING WORK PLATFORMS (EWP)

Advatek Systems Inc has the following policies pertaining to the operation and working on elevating work platforms

a. Employees must ensure all proper PPE is worn when working on EWP

b. Employees must wear Fall Arrest gear when working on EWP

c. Employees shall observe at all times the load limits when performing work This is regardless of the length of time of the work. Assessment of load is to be assessed at the maximum that will be in place during the length of the job. For example putting shingles on the roof the initial work load will be the heaviest so this should be assessed as your max load. However should it be removal of equipment from a location the end of the job will be the max load of the job.

d. Prior to the operation of the equipment for the first time that day the employee shall perform a walk around inspection to ensure that the equipment is safe and ready for operation.

e. All temporary work platforms are to be inspected before use, and put out of service immediately should any defects be found.

f. Advatek Systems Inc and Employees shall ensure that a metal scaffold is regularly inspected for any damage, deterioration or loosening of the connections of its structural members that may affect its strength and if such damage, deterioration or loosening is found, that the scaffold is removed from use until repaired.

3.22 OPERATION OF CRANES, HOISTS OR LIFTS

Advatek Systems Inc has the following policies pertaining to the operation cranes, hoists or lifts

a. The working kill zone must always be marked off. This is the area that the crane will traverse with and with out load

b. Only trained and competent employees shall be permitted to operate a crane, hoist or lift

c. Loads shall NEVER be passed over a person

d. Employees shall never enter the kill zone while a load is suspended.

e. A maintenance log book is to be kept for the crane

f. Prior to the operation of the equipment for the first time that day the employee shall perform a walk around inspection to ensure that the equipment is safe and ready for operation.

g. Should the operator of the equipment not be able to see the destination of the load a signal person MUST be used.

h. Lifting device load / lifting capacity is to be clearly displayed **on** the lifting device.

i. Lifting device load / lifting capacity must **NEVER** be exceeded.

3.23 HANDLING OF FLAMABLE OR COMBUSTIBLES SUBSTANCES

Advatek Systems Inc has the following policies pertaining to handling of flammable or combustible substances

a. Employees are trained in the safe handling, use, storage, and disposal of the substances they commonly come into contact with.

b. Employees provided with adequate information concerning the identity, nature, and potential hazards of the substance.

c. Employees are to confer with their MSDS sheets should they have questions on the substance they are handling

d. Employees shall never store an ignition source near a flammable / combustible

e. Employee shall never store two items together that when mixed may result in toxic fumes or promote a self ignition environment

f. Employees are responsible to seek assistance should they end up handling a substance they are not familiar with.

3.24 AIR BORN PARTICLE CONTAMINENTS

Employees & Contractors at Advatek Systems on occasion work in areas that contain high concentrations of air born particle, such as silica. When working in these conditions several precautions must be taken:

a. Employees and Contractors will ensure compliance with any onsite regulation provided by the customer.

b. Air samples should be taken to ensure that the concentration does not exceed recommended safe levels. Maximum Acceptable Level is stated at 0.025 mg/m3, 8 hr TWA

c. Employees will document on there work orders the test results and times

d. Employees will ensure that proper medical assistance is available should it be required

e. During work it is required to take air sample at intervals no greater than 1 hour to ensure concentrations have not exceeded safe limits

f. When working in an environment that contains air born contaminates such as silica proper PPE is required. Should you not be able to lower the levels of air born contaminants below the acceptable level then full respiratory PPE must be worn

g. If during work an employee suspects the levels of air born particle has suddenly risen, work shall stop and air sample will be taken. If the levels are still with in safe limits then work may resume

h. When working in areas that can be controlled using engineering controls it recommended that every effort should be taken to do so. If you are able to remove the source of the contamination it is recommended that this happen also.

i. At all times all Employees and member of the team they are working with should remain aware of the risks around them

j. If an employee is working in a confined space with air born contaminants the guidelines for both sections will be observed. And the more stringent of them taken as the correct procedure

3.25 Transportation (Commercial Vehicles >4500 kg GWR)

This section governs the usage of the Advatek Systems Inc Weight Test Truck (Test Truck).

A. Usage of the Test Truck are governed by all applicable Federal and Provincial laws & regulations. These **must** be followed completely at all times with out exception.

B. Before the Weight Truck departs the following items must be check.

   a. All Cargo is immobilized, secured and contained appropriately on the vehicle so as to not (leak, spill, blow off, fall from, fall through or other wish come off the vehicle during transportation

   b. All Cargo must also be securely placed so as to prevent movement that may unbalance the truck

   c. When securing loads straps that are used must be able to handle the weight and strain of the items they are securing. At no time will straps be used when the capacity is over 90% of what they are rat-

C. The driver of the Test Truck is responsible to ensure they are aware of any provincial regulations that affect them as they travel between provinces.

D. The driver of the Test Truck shall before departing inspect the truck for any deficiencies, leaks, or damages and record these as required. Inspections must happen each time before the truck hits the road

E. Any Trailer attached to the Test Truck must be inspected and any deficiencies must also be logged. Inspections must happen each time before the truck hits the road

F. While in operation the truck and trailers must be inspected at minimum once every 24 hours regardless of weather they hit the road or not.

G. Every person who carries out an inspection shall record on a trip inspection report any safety defects as disclosed in the inspection. If no safety defects are disclosed by the inspection, the person who carries out the inspection shall state this on the trip inspection report. All reports must be handed in when the driver next returns to the office.

H. At no time is the driver allowed to operate the Test Truck should they feel they are not able to do so competently, alter and with in the guidance of all applicable laws. This is applies to any over the counter medications that may impair your ability to perform you duties safely.

I. At no time shall the driver of the Test Truck exceed there allowed driving times regardless of how close to their destination they may be. These hours are as specified by the province in which you are currently operating. In accordance with SOR/2005-313 of the Motor Vehicle Transport Act

J. The driver if the Test Truck will fill out a daily log each day that accounts for all of the driver's on-duty time and off-duty time for that day. These will be verified and collected on return to the office.

K. Advatek System will provide the operator of the Test Truck training when required or requested to assist them in performing their duties

L. At no time shall the operator exceed 13 hours of driving time or 14 hours of on duty time in a day.

3.26 New or Short Term Employees

Employees with less than 3 months on the job experience or those who are full filling student learner roles are to be considered short term employees. This does not extended to industry cross higher where the new employee is already an experience professional in the same field as we provide service.

First and foremost short term employees may never work alone

Short term employees may go onto job site only if the following apply

- They are escorted at all times by a Senior Advatek Employee, to ensure their safety and HSE compliance
- The job does not contain any immediate or high risk hazards
- They have a need to be there to learn, the senior employee is also their to teach them and must be experience and trained in the process.

Advatek will also notify clients of the presence of a short term employee on the job crew. These individuals will have a pink strip on their hardhats for identification

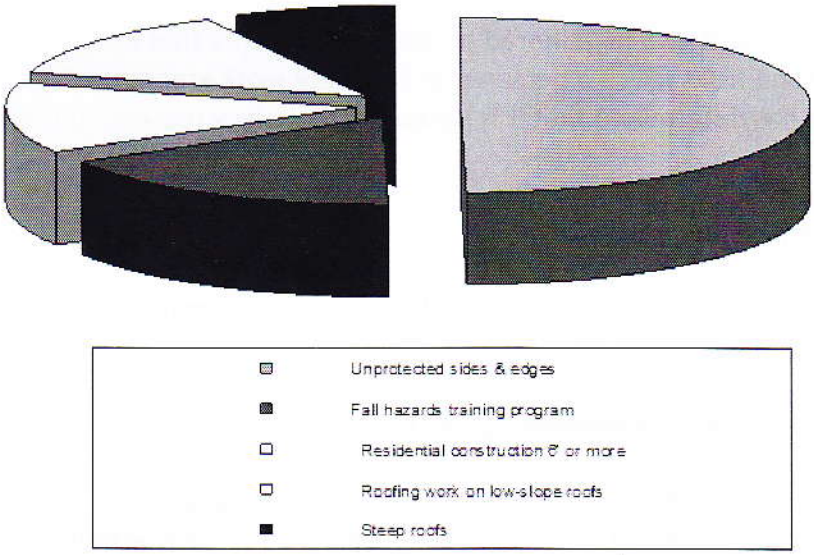
All subcontractors must also adhere to these guideline and standards, their HSE policy may add any additional safety requirements as needed.

Fall Protection Introduction

Fatal Facts ... Falls Kill

- **Falls** are the ***leading cause of fatalities*** in the construction industry.
- ***939 workplace fatalities*** *occurred 2009 in Canada according to StatsCan.*

Most Frequent Citation To Cause Death



Prevention

- Select fall protection systems appropriate for given situations.
- Use proper construction and installation of safety systems.
- Supervise employees properly.
- Use safe work procedures.
- Train workers in the proper selection, use, and maintenance of fall protection systems.

What does the law say? Sec. 49(1)

The employer shall provide and the employee shall continually use a fall-protection system when an employee works from an unguarded work area that is 3 m or more above water or the nearest permanent safe level, above any surface or object that could cause injury to the employee upon contact, or above any open top tank, bin, hopper or vat, a work area that is 3 m or more above a permanent safe level and from which a person may fall if the work area tips or fails, or a work area where an officer has determined that it is necessary for safety reasons to use a fall-protection system.

Fall Protection is Needed When... Sec.49 General Protection

The employer shall provide and the employee shall continually use a fall-protection system when an employee works from an unguarded work area that is:

- 3 m or more above water or the nearest permanent safe level,
- Above any surface or object that could cause injury to the employee upon contact, (**i.e. unusual possibility of injury**)
- Above any open top tank, bin, hopper or vat

A fall-protection system must also be adhered to when a work area that is 3 m or more above a permanent safe level and from which a person may fall if the work area tips or fails, or a work area where an officer has determined that it is necessary for safety reasons to use a fall-protection system.

****What is an Unusual *Possibility of Injury*?****

An unusual possibility of injury is when there is a chance the injury may be worse than an injury from landing on a solid, flat surface.

Responsibility of Employer and Implementing Fall Protection

1. An employer must install an engineering control such as a guardrail.
2. If the use of a guardrail is not reasonably practicable, an employer must ensure that a worker uses a travel restraint system that meets the requirements.
3. If the use of a travel restraint system is not reasonably practicable, an employer must ensure that a worker uses a personal fall arrest system that meets the requirements.
4. If the use of a personal fall arrest system is not reasonably practicable, an employer must ensure that a worker uses an equally effective fall protection system that meets the requirements of this part.

Workers Must Obey Company Policy

A worker must use or wear the fall protection system the employer requires the worker to use or wear in compliance with this Code.

Limiting an Employee's Free Fall Sec.29.2

An employer and a contractor must ensure that a fall-arresting system limits free falls to the shortest distance possible, which distance cannot exceed 1.8 m (8 kN/ 1800 lbs-f), and the total fall distance must be less than the distance from the work area to the next lower level, water or obstruction below.

What if an energy absorber/shock absorber cannot be used? Sec. 49.2(3)

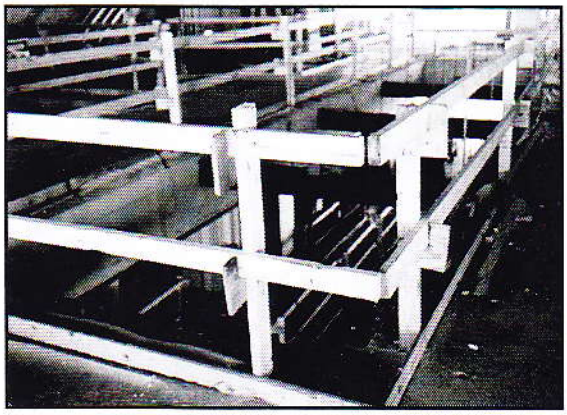
If using an energy absorber is hazardous or impracticable, the fall-arresting system shall not include an energy absorber, not use lanyards made of wire rope or other inelastic material, and must limit free falls to 1.2 m.

There Are Five Fall Protection Systems

1st	2nd	3rd	4th	5th
Guardrails System	Travel Restraint System	Fall Restricting System	Fall Arrest System or (PFAS)	Safety Net System

Guardrails System Sec. 97(2)

A guardrail system consists of a top rail, mid rail, and intermediate vertical member. Guardrail systems can also be combined with toe boards that prevent materials from rolling off the walking/working surface. Guardrail systems must be free of anything that might cut a worker or snag a worker's clothing.



Other Requirements for Guardrails and Toe Boards

- Install along open sides and ends
- Top rails 0.9 -1.07 metres tall (Midrails halfway between top rail and platform
- Toe boards must be 127 millimetres high has a space of not more than 6 mm between the bottom of the toeboard and the floor
- Posts, distance between, of the guardrail system may not be greater than 2.4 metres (Scaffold 3 M)

Temporary Guardrails

Temporary guardrails do not require a horizontal intermediate member if it has a substantial barrier positioned within the space bounded by the horizontal top member, toe board and vertical members that prevents a worker's falling through the space.

Guardrail Strength

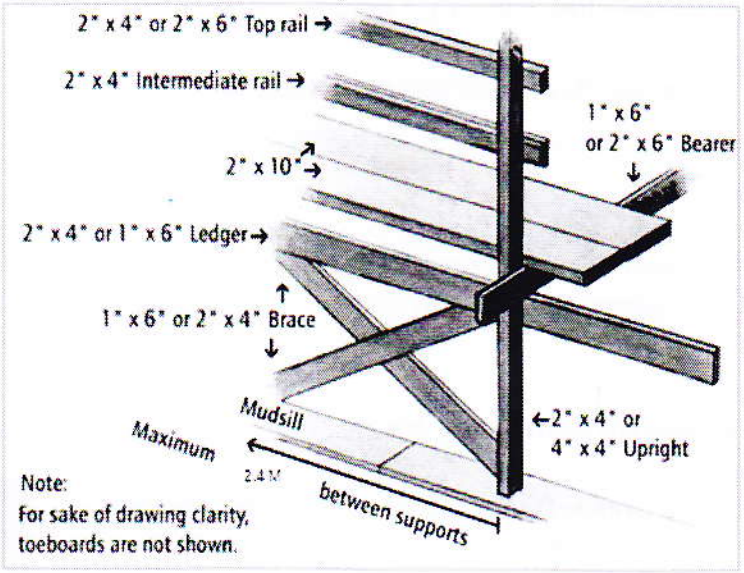
An employer must ensure that a guardrail is secured so that it cannot move in any direction if it is struck or any point on it comes into contact with a worker, materials or equipment.

Wood Guardrails Sec. 97(2)

The following additional requirements apply to a guardrail system that is made of wood:

1. The wood shall be spruce, pine or fir No.2 (S-P-F) timber of construction grade quality or better and shall not have any visible defect affecting its load-carrying capacity.

2. The wood shall be free of sharp objects such as splinters and protruding nails.



3. The system shall have posts that are at least 50 millimetres by 100 millimetres No. 2 grade or better SPF, are securely fastened to the surface and are spaced at intervals of not more than 3 metres.

4. The top rail and the intermediate rail shall each be at least 50 millimetres by 100 millimetres.

Wire Rope Guardrails Sec. 97(1)iv

The following additional requirements apply to a guardrail system that is made of wire rope:

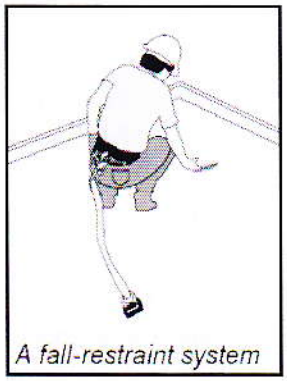
- The vertical supporting posts shall be made of steel of at least 40 mm in diameter or of a material of equivalent strength, and
- The top rail and intermediate rail shall be at least 10 mm in diameter, be attached to a welded fastening on the vertical supporting posts with metal clips to prevent unnecessary sagging and be easily distinguishable from the background.

Can wire mesh be utilized as a safety precaution?

An employer must ensure that wire mesh used in a safeguard required by this Code is

a. fabricated of wire at least 1.6 millimetres in diameter, and
b. spaced to reject a ball 40 millimetres in diameter.

A Travel Restraint System


A fall-restraint system

A travel restraint system prevents a worker from reaching an unprotected edge; and thus, prevents a fall from occurring. The system consists of an anchorage, connectors, and a body harness or a body belt. The attachment point to the body belt or full body harness can be at the back, front, or side D-rings.

The anchorage for a fall-restraint system must support at least 789 pounds of falling force or be designed and installed with a safety factor of at least two in conjunction with *Anchor Systems*.

A Travel Restraint System must include and be:

- A full body harness with adequate attachment points or a safety belt, and
- Attached to an independent fixed support (Anchor Point).

Restraint System Inspection:

- Restraint system shall be inspected by a competent worker before each use.
- If a component of the travel restraint system is found to be defective on inspection, the defective component shall immediately be taken out of service.


A positioning-device system with self-retracting lifeline

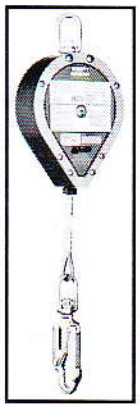
Positioning-Device Systems

Positioning-device systems, is a form of fall-travel restraint, making it easier to work with both hands free on a vertical surface such as a wall or concrete form. The components of a positioning-device system are as follows: anchorage, connectors, and body support. However, the systems serve different purposes. A positioning-device system provides support and is not designed to stop a workers fall; but merely to hold a worker in position, restraining a fall hazard.

- **Anchorage.** Positioning-device systems must be secured to an anchorage that can support at least twice the potential impact of a worker's fall or 3,000 pounds, whichever is greater.

- **Connectors.** Connectors must have a minimum strength of 5,000 pounds. Snap hooks and D-rings must be proof-tested to a minimum load of 3,600 pounds without deforming or breaking.

- **Body support.** A body belt is acceptable as part of a positioning-device system. However, it must limit the arresting force on a worker to 900 pounds, and it can only be used for body support. A full-body harness is also acceptable and must limit the arresting force to 1,800 pounds. Belts or harnesses must have side D-rings or a single front D-ring for positioning

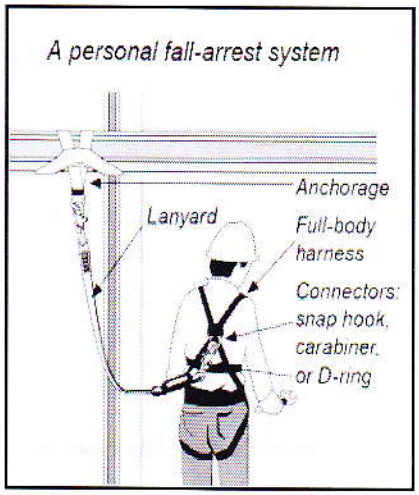


A Fall Restricting System (Retractable Devices)

A fall restraining device has been recently engineered to reduce a workers *'free fall'* to safe and lower distances. By reducing one's free fall distance, the damaging arresting force upon the human body can lessen to acceptable levels.

A fall restricting system must be:

- Attached to an independent fixed support (Anchor Point).
- Must reduce a worker's free fall distance to 1.2 metres or less (0.6 M most common).
- Inspected by a competent worker before each use.
- If defective on inspection, the defective component must immediately be taken out of service.
- If a worker who is using the fall restricting system falls or slips more than the distance determined, 0.6 metres, the system must be removed and certified by the manufacturer.



Personal Fall Arrest System (PFAS)

A personal fall arrest system includes an anchorage, connectors, and a full-body harness, lifeline, and a decelerating device, that work together to stop a sudden "STOP" after a fall and to minimize the arresting force of a fall. The personal fall-arrest system is effective only if the equipment is functioning properly, installed correctly, and the workers are knowledgeable about its uses. Only when all these factors are working in harmony can PFAS be effective. PFAS is the less effective means of preventing a fall and fall injuries.

A Fall Arrest System must include:

- Anchorage, connectors, and a full-body harness, lifeline, and a decelerating device.
- Fall arrest system must be arranged so that a worker does not hit the ground or an object or level below the work.
- The fall arrest system shall be inspected by a competent worker before each use.
- If a component(s) are defective on inspection, the defective component must immediately be taken out of service.

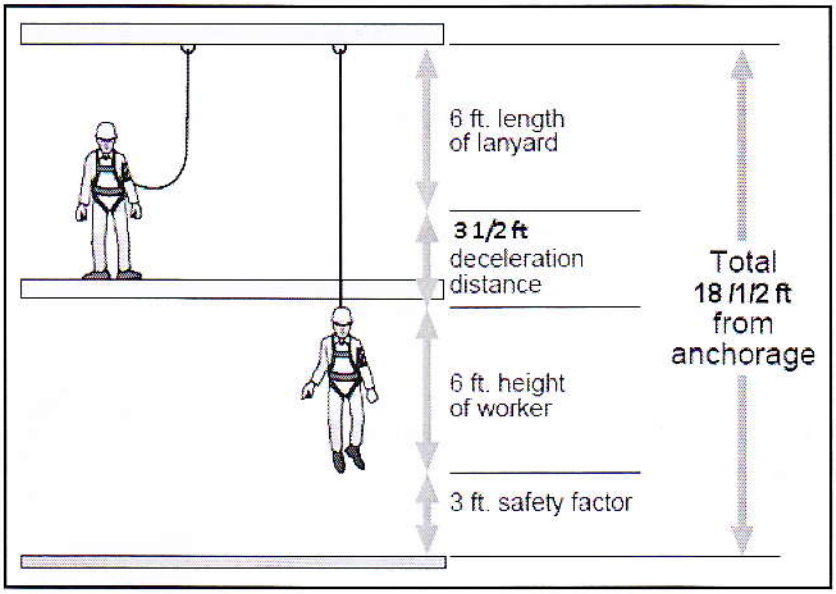
- If a worker who is using the fall arrest system falls, the system shall be immediately removed from service and shall not be used again by a worker unless all components of the system have been certified by the manufacturer as being safe for reuse.

Shock-Absorbing Lanyards Increase a Worker's Total Fall Distance!

Shock absorbers reduce the impact on a worker during fall arrest by extending up to 1 metre (3.3 feet) to absorb the arrest force. A worker's arresting force must be limited to 1,800 pounds to minimize injury, but a shock-absorbing lanyard can further reduce arresting force to 900 pounds.

A shock-absorbing lanyard extends up to 1 metre (3.3 feet) typically; thus, it's critical that the lanyard stops the worker before the next lower level. Allow about 6 vertical metres (20 feet) between the worker's anchorage point and the level below the working surface. Always estimate the total distance of a possible fall before using a shock-absorbing lanyard.

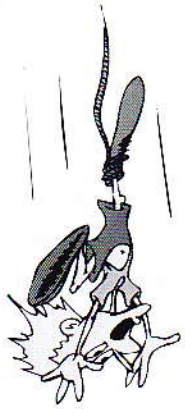
Worker's Total Fall Distance



Personal Fall Arrest Systems (PFAS)

"Free fall distance" means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall.

This distance excludes deceleration distance, lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.



"The Attachment Point" of the body harness shall be located in the center of the wearer's back near shoulder level, or above the wearer's head.

What if the fall protection system is activated or used?

If a worker who is using the fall protection system falls and is activated to stop the employees fall, the system shall be taken out of service immediately and shall not be used again by a worker unless all components of the system have been certified by the manufacturer as being safe for reuse.

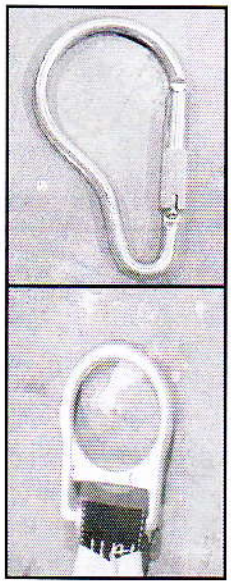
Personal Fall Arrest Systems must:

- Limit maximum arresting force on an employee to 1,800 pounds when used with a body harness;
- Be rigged such that an employee can neither free fall more than 6 feet (1.8 m), nor contact any lower level; and
- Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet.

Personal Fall Arrest Systems PFAS consist of Four Components

"Anchorage" means a secure point of attachment for lifelines, lanyards or deceleration devices.

Anchorages used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds (22.2 kn.) per employee attached.



"Connector" means a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabineer.

Connectors may be an integral component of part of the system (such as a buckle or D-ring sewn into a body belt or body harness, or a snap-hook spliced or sewn to a lanyard or self-retracting lanyard).

"Snaphooks" The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection.

Unless the snaphook is a locking type and designed for the following connections, snaphooks shall not be engaged:

- Directly to webbing, rope, or wire rope,
- To each other, or
- To a D-ring to which another snaphook or other connector is attached to a horizontal lifeline.

"Lanyards"

- Cannot be made of natural fiber rope
- Must be protected against damage by cuts or abrasions
- Each employee must be provided a separate lanyard.
- Lanyards must have a minimum breaking strength of 5000 pounds.

"Deceleration distance" means the additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate.

It is measured as the distance between the location of an employee's body belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.

Additional Requirements PFAS

- If subject to impact loading, examined by CP (See Manufacturer details)
- PFAS equipment is for employee protection and not to hoist materials
- Prompt rescue of employees in the event of a fall

- Inspected prior to each use
- Not attached to guardrail systems

Removal of Fall Protection Equipment from Service

An employer must ensure that equipment used as part of a fall protection system is removed from service and either returned to the manufacturer or destroyed if:

- Equipment is defective,
- Equipment has come into contact with excessive heat, a chemical, or any other substance that may corrode or otherwise damage the fall protection system, or
- After a personal fall arrest system has stopped a fall, the system is removed from service.

An employer must ensure that a personal fall arrest system that is removed from service is not returned to service unless a professional engineer or the manufacturer certifies that the system is safe to use.

Horizontal Lifelines Sec. 49.5-7

- Horizontal lifelines shall be designed by a Professional Engineer (PE), installed, and used, under the supervision of a competent person, as part of a complete personal fall arrest system.
- Devices used to connect to a horizontal lifeline which could become vertical must be capable of locking in both directions on the lifeline.

Horizontal Lifelines Design Must Include the Following

- Show the arrangement of the system including the anchorage or fixed support system,
- Indicate the components used,
- State the number of workers that can safely be attached to it,
- Set out instructions for installation or erection, and
- Show the design loads for the system.
- The system shall be installed or erected, and maintained, in accordance with the professional engineer's design.

- Before each use, the system shall be inspected by a PE or a competent worker designated by a supervisor.

- The constructor shall keep the design at the project while the system is in use.

Training Requirements

The following must be explained during instruction and training:

- ☐ Training must be instructed and evaluated by a competent person.
- ☐ The training is for each employee who might be exposed to falls.

Topics to be Covered in your Training Program

- ☐ A review of current Alberta Code pertaining to fall protection;
- ☐ An understanding of what a fall protection plan is;
- ☐ Fall protection methods, system, a worker is required to use at a work site;
- ☐ Identification of fall the hazards;
- ☐ Assessment and selection of specific anchors that the worker may use;
- ☐ Instructions for the correct use of connecting hardware;
- ☐ Information about the effect of a fall on the human body, including
- ☐ Maximum arresting force,
- ☐ The purpose of shock and energy absorbers,
    - Swing fall,
    - Free fall,
    - Pre-use inspection,
- ☐ Emergency response procedures to be used at the work site, if necessary; and
- ☐ Inspecting, fitting, adjusting and connecting fall protection systems and components, and
- ☐ Emergency response procedures
- ☐ The importance of inspections prior to use
- ☐ The limitations of the equipment
- ☐ The unique conditions at the worksite which may be important in determining the type of system to use

When any of the following occur, re-training is required:

- A fall occurs
- Other related items
- Serious incident occurs
- Near miss
- Changes to the fall protection
- New practices, procedures, or training.

Permanent/ Temporary Anchor Systems Sec. 49.2(1)(c)

An anchor is:

- Capable of safely withstanding the impact forces applied to it and
- Has a minimum breaking strength per attached worker of 22.2 kn (5000 lbs-f)

The employer must ensure that an anchor rated at two times the maximum arresting force is designed, installed and used in accordance with the manufacturer's specifications, or specifications certified by a professional engineer.

Safety Nets Sec. 49.8(1)

Safety nets are used where it is difficult or impossible to arrange for guardrailing, or to provide a proper anchoring and lifeline system for fall arrest. The most common applications for safety nets are bridge work or structural steel erection.

Safety nets may be installed as a form of fall protection, provided they meet the following requirements *ANSI Standard 10.11-1989*:

- Safety hooks or shackles of drawn, rolled or forged steel with an ultimate tensile strength of not less than 22.2 kn (5000 lbs)
- The joints between net panels capable of developing the full strength of the web
- Extends not less than 2.4 metres and extends not more than 6 metres beyond the work area
- The maximum deflection under impact load does not allow any part of the net to touch another surface.

Professional Engineers must Certify Safety Nets

An employer must ensure that the supporting structure to which a personnel safety net is attached is certified by a professional engineer as being capable of withstanding any load the net is likely to impose on the structure.

Covers or Holes

Covers or holes must be:

- Able to withstand twice expected load,
- Secured,
- Covered/or guard rail when not in use, and
- Marked with **'HOLE'** or **'COVER.'**

What does the law say about a written fall protection plan?

An employer must develop procedures that comply with this part in a fall protection plan for a work site if a worker at the worksite may fall 3 metres or more and the worker is not protected by guardrails.

Who Needs a Fall Rescue Plan/Post-Fall Rescue Procedure Sec. 50.1

"Written Fall Protection Rescue Plan" is available only to employees/employers when the use of guard rails had been proven to be infeasible and a fall arrest system or safety net system have been selected as employee fall protection. The written plan should also demonstrate that the preferred fall protection, guard rails, is impossible or it creates a greater hazard.

What Does a Written Fall Protection Plan Include?

A fall protection plan must specify:

- ☐ Fall hazards at the work site,
- ☐ Fall protection system to be used at the worksite,
- ☐ Anchors to be used during the work,
- ☐ Clearance distances below the work area, if applicable, have been confirmed as sufficient to prevent a worker from striking the ground or an object or level below the work area,
- ☐ Procedures used to assemble, maintain, inspect, use and disassemble the fall protection system, where applicable, and
- ☐ Rescue procedures to be used if a worker falls and is suspended by a personal fall arrest system or safety net and needs to be rescued.

The employer must ensure that the fall protection plan is available at the work site and is reviewed with workers before work with a risk of falling begins.

The employer must ensure that the plan is updated when conditions affecting fall protection change.

Additional Plan Details

- Prepared by a qualified person
- Specific to site
- Changes made by a qualified person

- Plan kept at site
- Implemented by competent person
- Documents why conventional fall protection is infeasible
- Discuss measures used to protect workers and how to retrieve them in a timely manner

What are Controlled Zones? Sec. 49.6

> ***"Controlled zone (CZ)"*** *means an area in which certain work (e.g., overhand bricklaying) may take place* ***without*** *the use of guardrail systems, personal fall arrest systems, or safety net systems and* ***access to the zone is controlled.***

Where leading edge and other operations are taking place, the controlled access zone shall be defined by a ***control line:***

- At least 3 M (10 feet) from leading edge,
- Connected at ends to guardrail or wall,
- Flagged or marked at least every six feet,
- 39 to 45 inches high (recommended), and
- 200 pound breaking strength (recommended).
- Control line can be used instead of guardrail system along leading edge to protect non-leading edge workers.

What Needs to be Documented?

The fall protection plan shall document the reasons why the uses of conventional fall protection systems (guardrail systems, personal fall arrest systems, or safety net systems) are infeasible or why their use would create a greater hazard.

- Identifies all controlled access zones (CAZ)
- Where no other measures are used, a safety monitor must be used
- Identify all CAZ employees
- If an employee falls, review plan to prevent reoccurrence.

SECTION 4

Occupational Health and Safety Act Sections and Schedules 49 - 51

Fall Protection

Fall Protection

#1 Unprotected sides & edges - Fall protection

Fall hazards training program

Fall protection - Residential construction 3M' or more

Fall protection - Roofing work on low-slope roofs

Fall protection - Steep roofs

Falls lead to Fatalities

- **Falls** are the ***leading cause of fatalities*** in the construction industry.
- An average of ***939 fatalities occurred each year***, with the trend on the increase.

That is 3.5 deaths per work day

Prevention

- **Select fall protection systems appropriate for given situations.**
- Use proper construction and installation of safety systems.
- Supervise employees properly.
- Use safe work procedures.
- Train workers in the proper selection, use, and maintenance of fall protection systems.

When is Fall Protection required? (Sec.49 General Protection)

A fall-protection system is needed when an employee works from an unguarded work area that is:

- 3 m or more above water or the nearest permanent safe level,

OR

- Above any surface or object that could cause injury to the employee upon contact, (**i.e. unusual possibility of injury**)

OR

- Above any open top tank, bin, hopper or vat

Note: An unusual possibility of injury is when there is a chance the injury may be worse than an injury from landing on a solid, flat surface.

Responsibility of Employer and Implementing Fall Protection

1. An employer must install an engineering control such as a guardrail.
2. If the use of a guardrail is not reasonably practicable, an employer must ensure that a worker uses a travel restraint system that meets the requirements.

Responsibility of Employer and Implementing Fall Protection

3. If the use of a travel restraint system is not reasonably practicable, an employer must ensure that a worker uses a (fall restraint), personal fall arrest system that meets the requirements.
4. If the use of a personal fall arrest system is not reasonably practicable, an employer must ensure that a worker uses an equally effective fall protection system that meets the requirements of this part.

Less Than 3m (10 feet) fall into….

- **Less than 3 Metres (10 feet)** fall or more, into operating machinery, liquid, hazardous substance, object, and through an opening on a work surface.

Ramps (Sec. 119)

- If less than 20 degrees from the horizontal: non-slip surface or cleats spaced 400 mm apart, and if; 2.24 m or less in width, must have handrails.

Open side perimeter or a balcony

- **3 Metres (10 feet)** fall, because of a perimeter or an open side, balcony

Open side perimeter or a balcony

- **3 Metres (10 feet)** fall, because of a perimeter or an open side, balcony

3 Metres (10 feet) Roof Form work

3 Metres (10 feet) scaffold platform or other work platform

When is Fall Protection required? (Sec. 139)

Recognize the Hazards…

Is This a Fall Hazard?

YES

Workers could fall while climbing on the shoring structure to set it up and remove it.

Ladders and lifts must be provided.

Any Fall Hazard Here?

YES

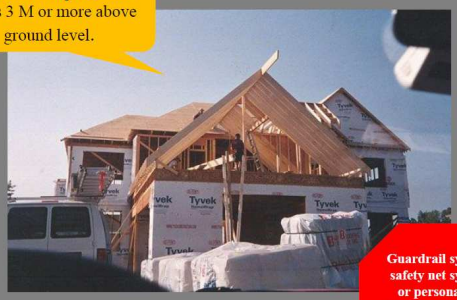
Workers are exposed to a fall hazard greater than 3 M, while working near stairwell opening.

Workers must be protected from falls /holes

Is This a Fall Hazard?

YES

Unprotected open-sided floors 3 M or more above ground level.



Guardrail systems, safety net systems or personal fall arrest systems are required.

Any Fall Hazard Here?

YES

Workers are installing a new metal roof without fall protection.

NOTE: Remember that ladders must at least 900 millimetres above the landing or floor the landing area & must have a clear space of at least 150 millimetres behind every rung

Is This a Fall Hazard?

YES

The photo shows a midrail and toeboard are missing on an open-sided floor of a building.

This could expose workers to a 3.5 M (12 ft) fall.

Toeboards are required to protect workers below from falling objects.

Can You Identify the Fall Hazard?

YES

Lack of fall protection for workers on fabricated frame scaffolds.

Planks appear to be overloaded and there is no safe access for workers.

The workers are exposed to a 35-foot fall hazard from a scaffold while stacking blocks prior to overhand bricklaying operations.

Can You Identify the Fall Hazard?

YES

Ladder to work platform is not of sufficient length.

It must extend 1M (3feet) above the working surface.

Is This a Fall Hazard?

YES

Worker is working off of the top of a step ladder.

The top of a stepladder shall not be used as a step.

Can You Identify the Fall Hazards?

YES

A worker is working from a carpenters' scaffold that has no guardrail, extends too far beyond either end, and is not wide enough.

The worker inside of the window is not provided with fall protection as there is no standard guardrail for the window.

The worker also does not have proper access to the scaffold.

The worker working below is exposed to the struck-by hazards of tools and equipment falling from the employees working above.

NOTE: A competent person must supervise as scaffolds are erected, moved and taken apart.

Any Fall Hazard Here?

YES

Workers working on balcony of structure exposed to fall hazard due to unprotected side/edge.

Is This a Fall Hazard?

YES

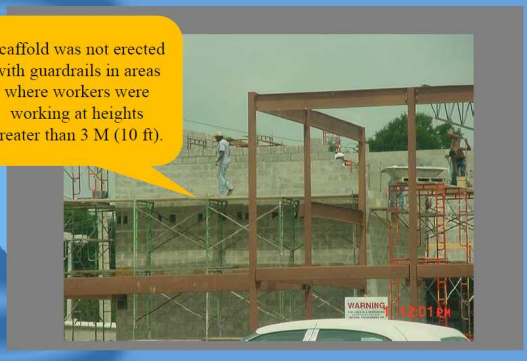
Worker working on an 8:12 pitch roof with only the lifeline tied to his waist as fall protection.

Employer must provide full body harnesses.

Is This a Fall Hazard?

YES

Scaffold was not erected with guardrails in areas where workers were working at heights greater than 3 M (10 ft).



Definitions

"Guardrail system" means a barrier erected to prevent employees from falling to lower levels.

Guardrail Systems

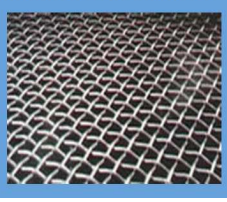
- Top rail, midrail, and toe board
- Top rail 0.9 -1.07 metres
- Midrails halfway between top rail and platform
- Toe board 127 millimetres high; 6mm from floor

Guardrail Systems Strength

- The guardrail is secured so that it cannot move in any direction if it is struck or any point on it comes into contact with a worker, materials or equipment.

Wire Mesh Utilized by FP

- Fabricated of wire at least 1.6 millimetres in diameter, and
- Spaced to reject a ball 40 millimetres in diameter.



Covers

- Withstand twice expected load
- Secured
- Marked with **'HOLE'** or **'COVER'**

Holes and Skylights

- Protect from: falling through, tripping or stepping into, and objects falling through

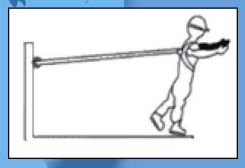
Written Fall Protection Rescue Plan

- Use of guard rails had been proven to be infeasible and a fall arrest system or safety net system have been selected
- The written plan should also demonstrate that the preferred fall protection, guard rails, is impossible or it creates a greater hazard, especially when working over water. Sec. 51(2)

Fall Protection Systems (FPS)

What are the 5 FPS ?

How do you calculate Travel Restraint?



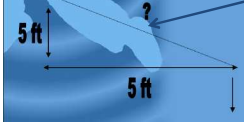
$A^n + B^n = C^n$

$5^n + 5^n = C^n$

$25 + 25 = C^n$

$50 = C$ Square root

= 7.0 ft



What are Controlled Zones? Sec. 50(4)

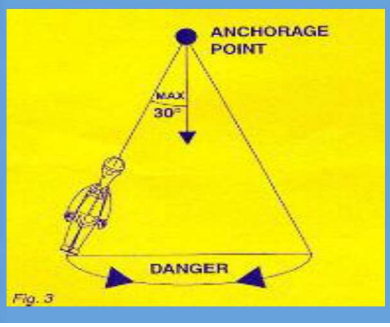
- At least 2 M (6.5 feet) from leading edge, **no greater than 3/12 slope**
- Connected at ends to guardrail or wall
- Flagged or marked at least every six feet
- Hand rail high is recommended
- 200 pound breaking strength

Fall Restricting System

- Reduce a worker's free fall distance to 1.2 metres or less. (0.6 typically)
- Inspected before each use
- Is only appropriate for specific circumstances

- Is best utilized when anchored over head

30 degrees from the vertical



Personal Fall Arrest Systems PFAS

Limiting an Employee's Free Fall Sec. 29.2

- An employer and a contractor must ensure that a fall-arresting system limits free falls to the shortest distance possible, which distance cannot exceed 1.8 m (8 kN/ 1800 lbs-f), and the total fall distance must be less than the distance from the work area to the next lower level, water or obstruction below.

Personal Fall Arrest Systems (PFAS)

210 lb person

6 foot free fall

How much arresting force is generated?

2500-2700 lbs

Personal Fall Arrest Systems PFAS

How much arresting force can we take physically?

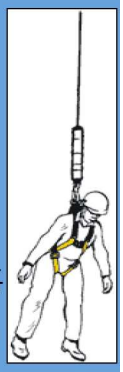
1800 lbs

Free Fall Distance

"Free fall distance" means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall.

Total Fall Distance

	AVG	MIN
• 6 ft Lanyard	**6 ft**	6FT
• 3.5-4 ft deceleration	**3.5-4 ft**	3.5FT
• 2 ft Lifeline stretch or harness chaff	**2 ft**	1 FT
• 5 ft below lifeline	**5 ft**	5 FT
• Total: **16.5-17 ft** to lower level		15.5 FT



ADVATEK SYSTEMS INC SUGGETS 19 ft FALL DISTANCE BEFORE USING PFAS. TO ENSURE NO IMPACT WITH THE FLOOR BELOW

Personal Fall Arrest Systems PFAS

What is the maximum possible free fall distance while using a 6 foot lanyard, if anchored at foot level?

12 feet + 5 feet =17 feet

Additional Requirements PFAS

- Inspected prior to each use
- Not attached to guardrail systems
- At hoist areas, allow movement to edge only

Personal Fall Arrest Systems PFAS

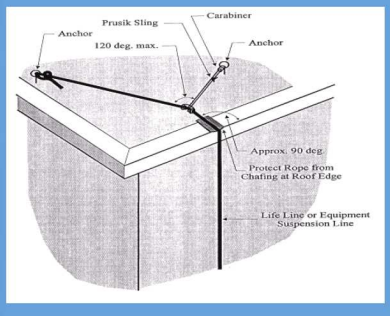
Each PFAS consists of 4 components:

1. Anchor Point
2. Connector
3. Harness
4. Rescue

Anchorage

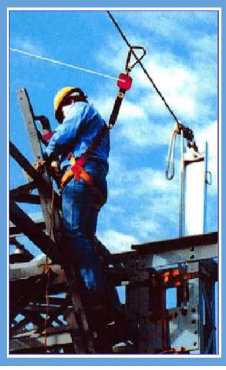
"Anchorage" means a secure point of attachment for lifelines, lanyards or deceleration devices.

Anchorage Temporary/Permanent



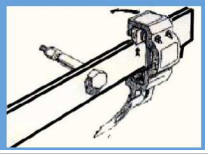
Anchorage

- As part of a complete personal fall arrest system which maintains a safety factor of at least two; and
- Under the supervision of a qualified person.



Permanent Anchorage (29(2)(1)(c)

- A anchor is capable of safely withstanding the impact forces applied to it and has a minimum breaking strength per attached worker **of 22.2kn (5000 lbs)** or
- Is designed, installed and used in accordance with the manufacturer's specifications, or specifications certified by a professional engineer



Connector

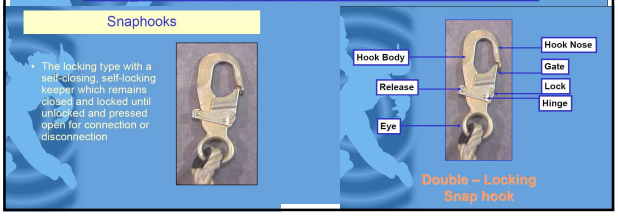
- Used to couple (connect) parts of the personal fall arrest system

Connector

- Buckle or d-ring sewn into a body belt or body harness

Snaphooks

- The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection.
- ***The use of a non-locking snaphook as part of personal fall arrest systems and positioning device systems is prohibited.***



Snaphooks

- Unless the snaphook is a locking type and designed for the following connections, snaphooks shall not be engaged:
  - Directly to webbing, rope, or wire rope
  - To each other
  - To a d-ring to which another snaphook or other connector is attached
  - To a horizontal lifeline

Lanyard

- Cannot be made of natural fiber rope
- Must be protected against damage by cuts or abrasions
- Each employee must be provided a separate lanyard
- Lanyards must have a minimum breaking strength of 5,000 pounds

Deceleration Distance

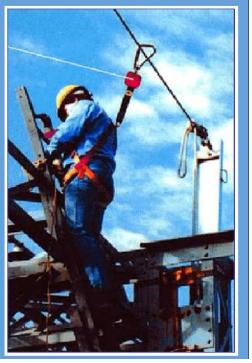
"Deceleration distance" means the additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate.

Additional Requirements PFAS

- PFAS used only for fall protection
- If subject to impact loading, examined by CP
- Prompt rescue provided

Horizontal Lifelines

- Horizontal lifelines shall be designed, designed by a Professional Engineer (PE)
- Devices used to connect to a horizontal lifeline which could become vertical must be capable of locking in both directions on the lifeline.



Horizontal Lifelines

- Devices used to connect to a horizontal lifeline which could become **vertical** must be capable of locking in both directions on the lifeline.

HORIZONTAL LIFE LINE.

IS THIS SAFE?

DO YOU THINK THIS WAS DESINGED BY A PROFESSIONAL ENGINEER?

Safety Nets

- Personal safety net must be installed within at least 4.6 m below the work area
- ***Certified*** by employers CP
- Extends sufficiently from outer edge
- Competent person must inspect and test the installation of the safety net before it is put in service.
- Objects removed and have PE Doc on site
- Border rope strength of 5,000 pounds

Training

- For each employee who might be exposed to falls
- Trained by competent person
- Covers fall hazards in work area
- Covers procedures for FPS to be used

NUMBERS TO REMEMBER ON FALL PROTECTION

- Guardrail height 0.90m to 1.07m (must have top & mid rails & posts)
- Using a PFAS the best fall distance is 4.7m (15.5ft)
- Using a PFAS the average fall distance is 16.5ft – 17ft
- Fall restriction limits falls to 0.6m (2ft)
- Human body is prone to injury after 1800lbs of force
- Near holes or openings fall protection starts at 0m
- Order of preference for Fall Protection
  - Guard Rails
  - Travel Restraint
  - Fall Restriction
  - Personal Fall Arrest System
  - Other (safety nets, spotters)

SECTION 5

Ladders

Sections and Schedules 122 - 129

Ladder markings Sec. 124(1)

- Portable ladder manufactured after July 1, 2009 meets the requirements of:
  - CSA Standard CAN3-Z11-M81 (R2005), Portable Ladders,
  - ANSI Standard A14.1-2007, American National Standard for Ladders – Wood – Safety Requirements,
  - ANSI Standard A14.2-2007, American National Standard for Ladders – Portable Metal – Safety Requirements, or
  - ANSI Standard A14.5-2007, American National Standard for Ladders – Portable Reinforced Plastic – Safety Requirements.

Ladders Sec. 122(1)

- A ladder shall be designed, constructed and maintained so as not to endanger a worker and shall be capable of withstanding all loads to which it may be subjected.

Portable Ladders 123(d)(iii)

A ladder

- (a) shall be free from defective or loose rungs;
- (b) shall have rungs spaced at 300 millimetres on centres;
- (c) shall have side rails at least 300 millimetres apart;
- (d) shall be placed on a firm footing

Portable Ladder Stability (Sec. 125)

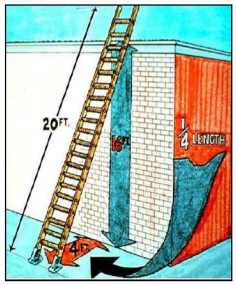
A ladder:

- Must be secured against movement and placed on a base that is stable.

Question:
Does a Ladder always need to be tied off?

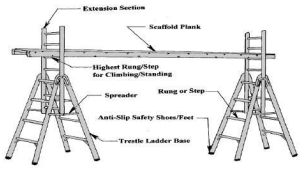
Portable Ladders Pitch (1/4 Length) (Sec. 125)

- The base of an inclined portable ladder is no further from the base of the wall or structure than ¼ of the height to where the ladder contacts the wall or structure.



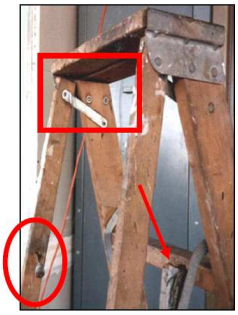
Extension Trestle Ladder

- The maximum length of a ladder measured along its side rail shall not be more than
- five metres for a trestle ladder or for each of the base and extension sections of an extension trestle ladder



Extension Trestle Ladder
(often used in pairs to support a scaffold plank)

Portable Ladder Heights



- Six metres for a step-ladder;
- Nine metres for a single ladder or an individual section of a ladder;
- Fifteen metres for an extension ladder with two sections; and
- Twenty metres for an extension ladder with more than two sections.
- No ladder shall be lashed to another ladder to increase its length.

Portable Ladders Access Sec. 125(2)(b)

A ladder used as a regular means of access between levels of a structure:

- Shall extend at the upper level at least **1 metre** above the landing or floor;
- Shall have a clear space of at least 15 cm behind every rung;
- Shall be located so that an adequate landing surface that is clear of obstructions is available at the top and bottom of the ladder;

Wood Ladders-No Paint

A wooden ladder

- shall be made of wood that is straight-grained and free of loose knots, sharp edges, splinters and shakes; and
- shall not be painted or coated with an opaque material.

Constructed Wood Ladders

The side rails of a wooden ladder of the cleat type:

- That has a length of 5 m or less
  - Has side rails constructed of lumber measuring not less than 38 mm by 89 mm,
- More than 5 m long
  - Has side rails constructed of lumber measuring not less than 38 mm by 140 mm,
  - Has side rails that are not notched, dapped, tapered or spliced,
  - Has side rails at least 500 mm apart at the bottom.

Wood Ladders

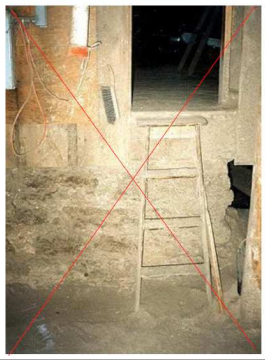
- The rungs of a wooden ladder of the cleat type,
- shall measure not less than,
- nineteen millimetres by sixty-four millimetres if the side rails are 400 millimetres apart, or
- nineteen millimetres by eighty-nine millimetres if the side rails are more than 400 millimetres and not more than 610 millimetres apart; and
- shall be braced by filler blocks that are nineteen millimetres thick and are located between the rungs.

Self-Supporting Ladders

- No worker shall stand on the top of or the pail shelf of a step-ladder or work from the top **three rungs** of a portable single or extension ladder. Sec. 125 (3)(d)

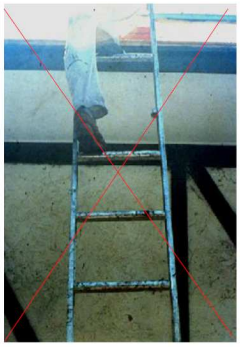
Portable Ladders

The tops of the ordinary types of stepladders shall not be used as steps.



Portable Metal Ladders

What's Wrong with this picture?



Use of Ladders

When ascending or descending the climber must face the ladder.

Portable Ladder Fall Protection Sec. 124 (3)

An employee working 3 m or more above the ground or floor level on a portable ladder may work without a fall-protection system if:

1. The work is a light duty task of short duration at each location,
2. The employee's centre of gravity is maintained between the two ladder side rails,

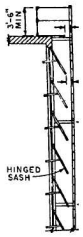
Ladder Fall Protection cont…

3. The employee will generally have one hand available to hold on to the ladder or another support, and
4. The ladder is not positioned near an edge or floor opening that would significantly increase the potential fall distance.

Note: This section does not apply while the worker is moving up or down the portable ladder.

WHAT WENT WRONG?

Fixed Ladders



Access Ladder Fixed in Position

- (1) Subject to subsection (2), an access ladder fixed in position,
- (a) shall be vertical;
- (b) shall have rest platforms at not more than **nine metre** intervals;
- (c) shall be offset at each rest platform;

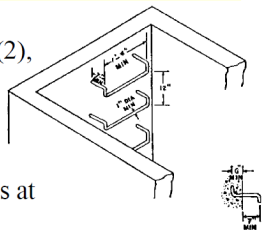


FIGURE D–1.—Suggested design for rungs on individual-rung ladders.

Cages or Wells

- (d) where the ladder extends over 3 metres above grade, floor or landing, shall have a safety **cage commencing not more than 2.2 metres** above grade, floor or landing and continuing at least 90 centimetres above the top landing with openings to permit access by a worker to rest platforms or to the top landing;
- (e) shall have side rails that extend 90 centimetres above the landing; and
- (f) shall have rungs that are at least 15 centimetres from the wall and spaced at regular intervals.
- Sec 121(1)

* Does not apply to drilling or services rigs with climb assist

NUMBERS TO REMEMBER WITH LADDERS

- Ladders need rungs 300mm on center and rails **least** 300mm apart
- Ladders can only handle the load they are rated for
- Ladders must clear the work surface by a min of 1m
- Ladders must be 1 ft out for every 4 ft up
- Ladders need a 15cm/150mm clearance behind every rung
- Maximum height of a step Ladder is 6m
- Fixed ladders need a rest platform every 9m

Extension Ladder Over Lap:

- Overlap for an extension ladder of 11 m or less is 1.00m
- Overlap for an extension ladder of 11 - 15 m is 1.25m
- Overlap for an extension ladder of 15 – 22 m is 1.50m

DAMAGED LADDERS MUST BE TAGGED AND DESTROYED

Ladders

Occupational Health and Safety Act

SECTION 5

Sections and Schedules 122 - 129

Ladder Markings

An employer must ensure that a portable ladder manufactured on or after July 1, 2009 meets the requirements of:

- CSA Standard CAN3-Z11-M81 (R2005), Portable Ladders, **Sec. 124(1)**

Other Recognized Ladder Standards:

- ANSI Standard A14.1-2007, American National Standard for Ladders - Wood - Safety Requirements,
- ANSI Standard A14.2-2007, American National Standard for Ladders - Portable Metal - Safety Requirements, or
- ANSI Standard A14.5-2007, American National Standard for Ladders - Portable Reinforced Plastic - Safety Requirements.

Portable Ladders Sec. 122(1)

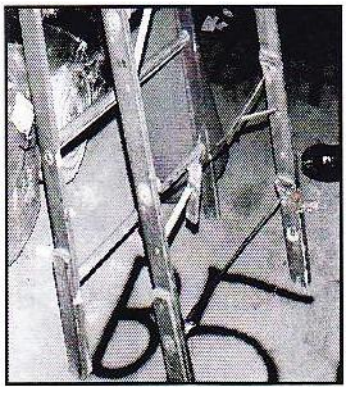
An employer shall ensure that a portable ladder used at a place of employment is of adequate strength and length, clean and free of grease, and maintained in a safe condition.

A ladder shall be designed, constructed and maintained so as not to endanger a worker and shall be capable of withstanding all loads to which it may be subjected.

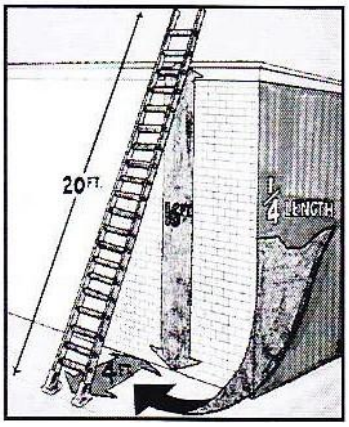
Ladder Maintenance Sec. 123(d)(iii)

A ladder:

- Shall be free from defective or loose rungs,
- Shall have rungs spaced at 300 millimetres on centres,
- Shall have side rails at least 300 millimetres apart, and
- Shall be placed on a firm footing.



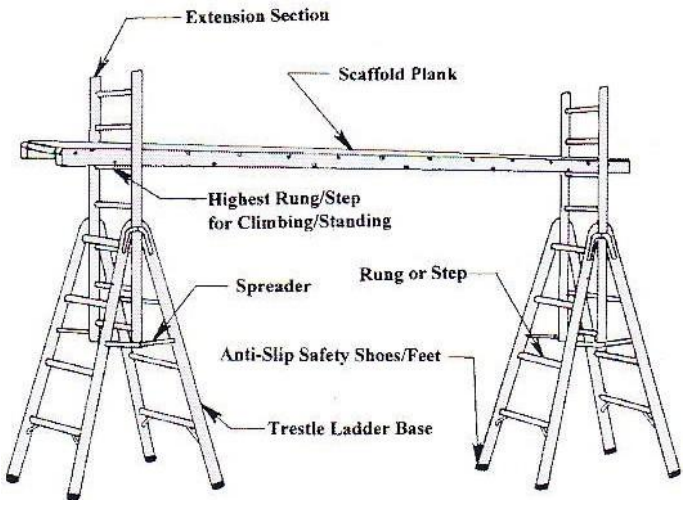
Ladder Stability and Pitch (1/4 Length) Sec. 125
(Legislative Interpretations Date Issued: October 8, 1997)



A ladder:

- Must be secured against movement and placed on a base that is stable.
- The base of an inclined portable ladder is no further from the base of the wall or structure than¼ of the height to where the ladder contacts the wall or structure.

Trestle Ladder



The maximum length of a ladder measured along its side rail shall not be more than 5 metres for a trestle ladder or for each of the base and extension sections of an extension trestle ladder.

Portable Ladders Lengths Sec. 124(2)

- 6 metres for a step-ladder
- 9 metres for a single ladder or an individual secti0r:i of a ladder
- A ladder is 11 m or less, overlap shall be 1 m
- A ladder exceeds 11 m and is 15 m or less, the overlap shall be 1.25
- A ladder exceeds 15 m and is 22 m or less, the overlap shall be 1.5 m

No ladder shall be lashed to another ladder to increase its length.

Portable Ladders Access Sec. 125(2)(b)

A ladder used as a regular means of access between levels of a structure:

- Shall extend at the upper level at least 1 metre above the landing or floor,
  Recommended to have a clear space of at least 15 cm behind every rung and,
- Be located so that anadequate landing surface that is clear of obstructions is available at the top and bottom of the ladder.

Constructed Wood Ladders

A wooden ladder:

- Shall be made of wood that is straight-grained and free of loose knots, sharp edges, splinters and shakes; and
- Shall not be painted or coated with an opaque material

The side rails of a wooden ladder of the cleat type:

- That has a length of 5 metres or less
  - Has side rails constructed of lumber measuring not less than 38 millimetres by 89 millimetres,
- More than 5 metres long
  - Has side rails constructed of lumber measuring not less than 38 millimetres by 140 millimetres,
  - Has side rails that are not notched, dapped, tapered or spliced,
  - Has side rails at least 500 millimetres apart at the bottom.

Rungs must be:

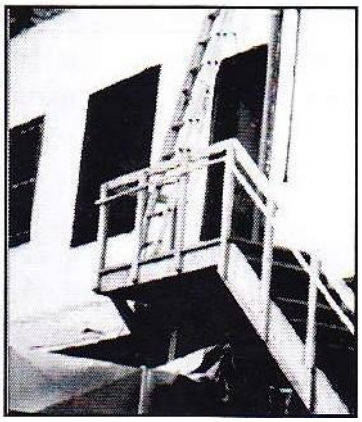
- Constructed of lumber measuring not less than 21 millimetres by 89 millimetres,
- Held by filler blocks or secured by a single continuous wire, and
- Uniformly spaced at a centre to centre distance of 250 millimetres to 300 millimetres.

Self-Supporting Ladders Sec. 125(3)(d) [NEW]

When a step-ladder is being used as a self-supporting unit, its legs shall be fully-spread and its spreader shall be locked. Never stand on the material shelf, the top or the top step of a portable step ladder, or work from the top three rungs of a portable single or extension ladder.

Frequent Ladder Errors

- Wooden ladders cannot be painted
- No worker shall stand on the top of or the pail shelf of a step-ladder
- Do not place ladders in front of doors opening toward the ladder; unless the door is blocked upon, locked, or guarded.
- Ladders cannot be placed on boxes, barrels, or other unstable bases to obtain additional height.

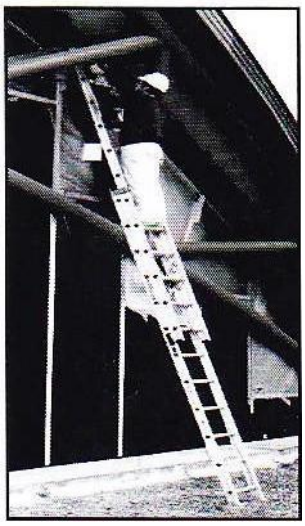


Ladder Overlap in Feet and Inches

Based on the nominal length of the ladder, each section of a multi-section ladder shall overlap the adjacent section by at least the number of feet stated, as recommended by the manufacturer in feet:

Ladder Length	Required Overlap
Up to and including 36 feet	3.3 feet
Over 36, up to and including 49 feet	4.1 feet
Over 49, up to 72 feet	5 feet

4.1



Portable Ladder Fall Protection Sec. 124 (3)

An employee working 3 m or more above the ground or floor level on a portable ladder may work without a fall-protection system if:

- The work is a light duty task of short duration at each location,
- The employee's centre of gravity is maintained between the two ladder side rails,
- The employee will generally have one hand available to hold on to the ladder or another support, and
- The ladder is not positioned near an edge or floor opening that would significantly increase the potential fall distance.

Note: This section does not apply while the worker is moving up or down the portable ladder.

Access Ladder Fixed in Position

An access ladder fixed in position:

- Shall be vertical,
- Shall have rest platforms at no more than 9 metre intervals, and
- Shall be offset at each rest platform.

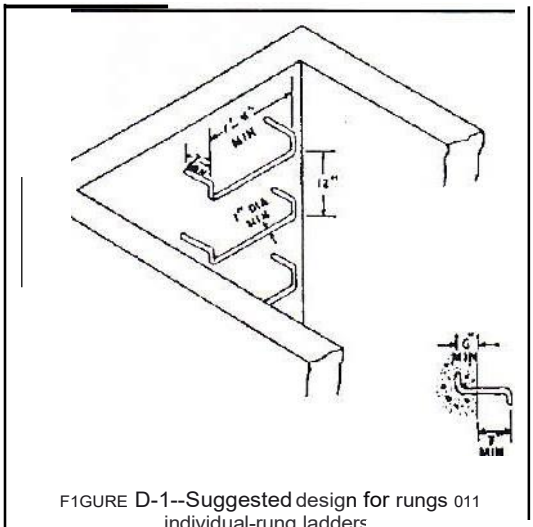


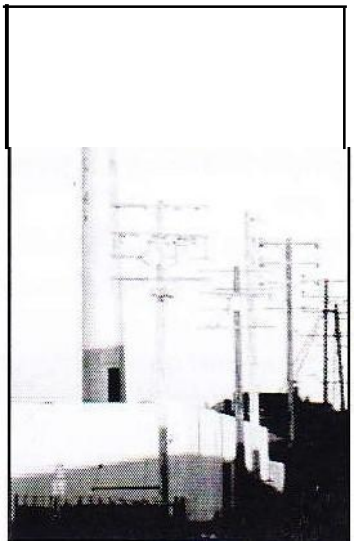
FIGURE D-1--Suggested design for rungs of individual-rung ladders

Cages or Wells Sec. 121(1)

Where a ladder cage is used on a fixed ladder, an employer shall ensure that:

- A fixed ladder that is more than 6 min height is equipped with ladder cages.
- The cage is provided with metal hoops spaced to prevent an employee from falling away from the ladder and to contain an employee who may lean or fall against the cage,
- The cage extends not less than 685 mm and not more than 725 mm from the centre line of the rungs of the ladder,
- The cage is not less than 685 mm wide where it attaches to the ladder,
- The cage extends from a point 2.5 m from the base of the ladder to the top of the ladder, the inside of the cage is free of projections, and
- If the fixed ladder is more than 9 min height, it is equipped with a rest platform at intervals of no more than 9 m.

Note: Does not apply where an employee on the ladder uses a fall-arresting system



Reminders:

- Any ladders operated near electrical systems must be non conductive
- All ladders must be CSA approved
- All ladders must be secured against movement
- You must ensure a minimum of three (3) rungs above a level you wish to work from
- You may never use the top two (2) rungs for work.

SECTION 6

Workplace
Hazardous
Materials
Information
System

What is a Hazard?

Physical Hazards

Health Hazards

Physical Hazards

FIRE

Reaction to:
- Air
- Water

EXPLOSION

- Light
- Spark
- Heat

Health Hazards

- Carcinogenic – *Cancer Causing*
- Corrosives – *Skin Rash*
- Highly Toxic and Toxic – *Cause Death*
- Irritant – *Inflammation*
- Sensitizer – *Allergic Reaction*
- Target Organ Effects – *Kills Organs*
- Acute Effects – *React Immediately*
- Chronic Effects – *Long-Term Reactions*

Exposure Limits

- Permissible Exposure Limit (TLV-PEL):
  - No adverse health effect in a 8 hour workday, 40 hour week
- Short-term Exposure Limit (TLV-STEL):
  - No more than 15 min at any given time
  - 4 x 15 min periods in 8hrs, with an hour between each period

Exposure Limits…Cont.

- Ceiling Exposure (TLV-C):
  - The limit of concentration that should not be exceeded momentarily.
- Odor Threshold:
  - The lowest concentration of a substance in air that can be detected by smell.
  - How does this compare with the PEL and IDLH?

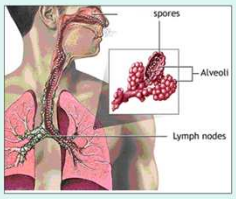
Exposure Limits… Cont.

- TLV-Skin:
  - The skin designation refers to the potential contribution to the overall exposure by the route of entry, including mucous membranes and the eye. Exposure can be either by airborne or direct contact with the substance.

    This designation indicates that appropriate measures should be taken to prevent skin absorption.

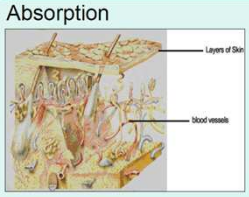
Routes of Entry

Inhalation



Routes of Entry

Absorption



Chemicals absorbed through the eye then enter the bloodstream.

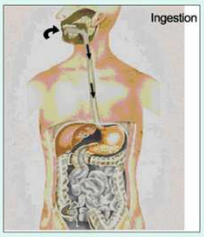
- Cuts or cracked skin
- Rashes
- Dry, flaky, and sore skin

Routes of Entry

Ingestion

Chemicals left on:

- Hands
- Clothing
- Facial Hair
- Food, Drinks, and Cigarettes



Routes of Entry

Injection

- Hydraulic lines
- Compressed air tools
- Needle stick injuries

Toxicity vs. Dose

TOXICITY	Very Low	Low	Moderate	High	Very High
HAZARD POTENTIAL	Very Low	Low	Moderate	High	Very High
DOSE	Very Low	Low	Moderate	High	Very High

Toxicity vs. Dose

TOXICITY	Very Low	Low	Moderate	High	Very High
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Toxicity vs. Dose

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HAZARD POTENTIAL	Very Low	Low	Moderate	High	Very High
DOSE	Very Low	Low	Moderate	High	Very High

Corrosives

Corrosive

- Visible destruction, or irreversible damage to body tissue
- Acids
- Caustics (or bases)

Acids — **pH Scale** — Caustics (or bases)

1 7 14

Solid Corrosives (Bases)

- Preferred
  - Powder
  - Granular
- Safer in solid form
- Dangers to avoid
  - Moisture
    - Eyes, nose, lungs, and mucous membranes are greatest at risk
  - Delayed reaction

Corrosives

- Airborne Particles (Dust)
  - Rashes
  - Ulcers
  - Burns

* Permanent damage is unavoidable.

Dust Control Measures

- **Spot Ventilation**
  - Removes ph isolated area
  - Customized to the hazard
  - Corrosive hazards are contained faster and travel less
- **General Ventilation**
  - Ventilates the entire area
  - Moves the hazard across large area
  - Takes much longer to contain
  - Potentially contaminating others

Corrosive PPE

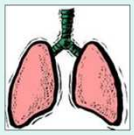
- Wash PPE to clean off dried residue
- Gloves
- Face shield
- Goggles (vent free only for fuels)
- Apron
- Rubber Boots (use as needed)
- Respirators

Accidental Contact Liquid

- Skin contact
  - Flush skin with a high flow of water for 15 minutes as a minimum
- Digestion
  - Drink Milk to coat and dilute
  - **DO NOT Vomit**, this increases damage to the throat and stomach lining by reintroducing the chemical again.

Corrosive Gases

- Are often produced naturally off Solid Corrosives or exists as a vapor
- Most common damaged areas:
  - Respiratory Systems
  - Eyes



MSDS (ANSI 16)

MSDS Musts Requirements:

1. Product Identification
   - Formula and Trade Name
2. Composition
   - Ingredients
3. Hazard Identification
   - Overview of physical and health hazards
4. First Aid Procedures

MSDS (ANSI 16)

5. Fire Fighting Procedures
   - Flash point, Auto ignition, UEL, and LEL
   - Extinguisher type
6. Accidental Release
7. Storage
8. Exposure Controls
   - PPE

MSDS (ANSI 16)

9. Chemical Properties
   - Odor, Color, State
10. Stability and Reactible
    - Air, Heat, Light, and Vibration
11. Toxicological Information
    - TWV, PEL (dose levels)
12. Ecological Information
    - Environmental

MSDS (ANSI 16)

13. Disposal Requirements
14. Transportation
15. Regulative Information
16. Other Recommendations

How to teach MSDS

All MSDS be broken down into the following:

1. Product Identification
   - Trade name, other names, and formula
   - Address
   - Emergency Contact Info…
   - Date of last revision
   - Ingredients

How to teach MSDS…cont.

Product Identification cont.

- Exposure Limits
  - PEL and TLV
  - STEL
- Health Hazards
- Routes of Entry
- Chronic and Acute Effects

How to teach MSDS…cont.

2. Exposure Situations
   - First Aid
   - Fire
     - Flammable limits UEL and LEL
     - Auto ignition temperature
     - Flash point
   - Accidental release/Clean-up

How to teach MSDS…cont.

3. Hazard Prevention & Protection
   - Handling and Storage
   - Heat, Sunlight, and Vibration
   - Engineering Controls (PPE, Ventilation)
   - Physical & Chemical Properties
     - Evaporation points
     - Vapor density
     - Appearance
     - Melting and boiling points
   - Stable or unstable
   - Conditions that cause reactions and release

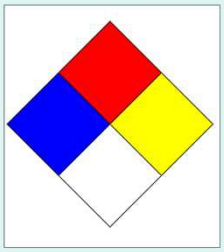
How to teach MSDS…cont.

4. Other Specific Information
   (Emergency Response)
   - Toxicological
   - Ecological
   - Disposal
   - Transportation
   - Laws and regulations

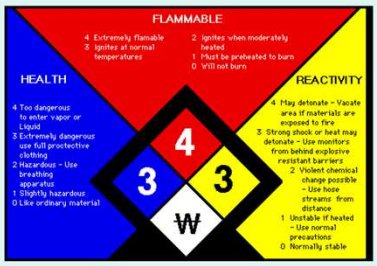
Labels

- Ministry of Transportation (MTO)
- National Fire Protection Agency (NFPA)
- Hazardous Material Identification System (HMIS)
- Waste Labels (Prov Requirements)
- Batch labels/tickets
- Company labels

NFPA / HMIS Chemical Hazard Label



NFPA Chemical Hazard Label



Chemical Hazard Label

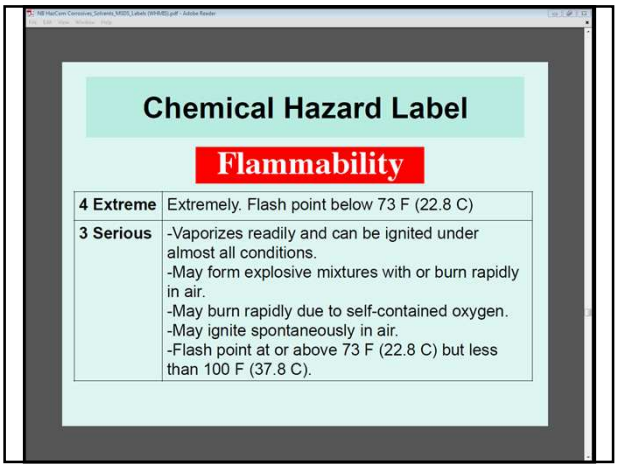
HEALTH

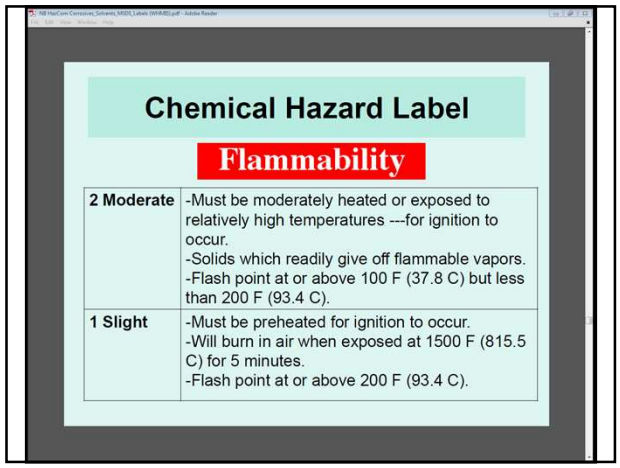
4 Extreme	-On very short exposure could cause death or major residual injury even though prompt medical treatment is given. -A known or suspected **human** carcinogen.
3 Serious	-May cause serious temporary or residual injury on short term exposure even though prompt medical attention is given. -A known or suspected **small animal** carcinogen.
2 Moderate	-Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical treatment is given.

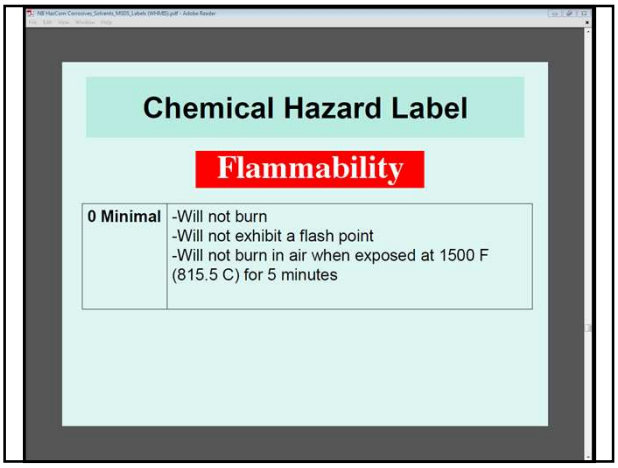
Chemical Hazard Label

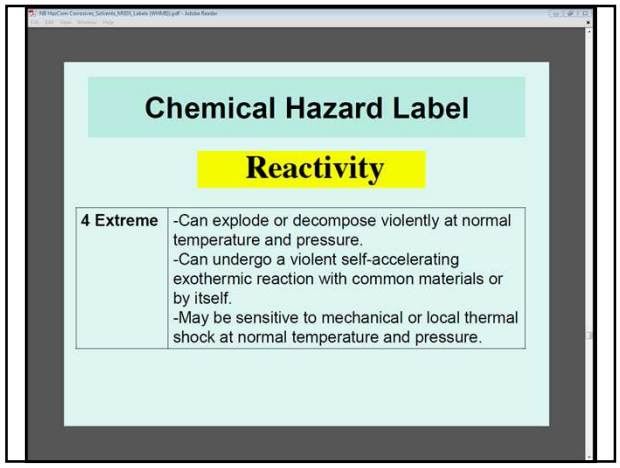
HEALTH

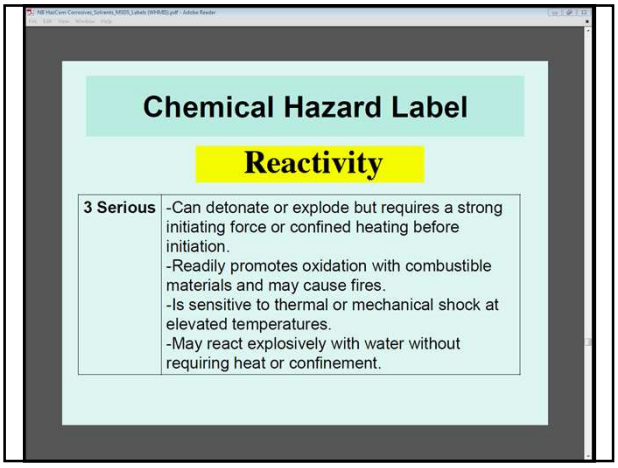
1 Slight	-May cause irritation but only minor residual injury even without treatment. -Recognized innocuous material when used with responsible care.
0 Minimal	-No chemical is without some degree of toxicity.

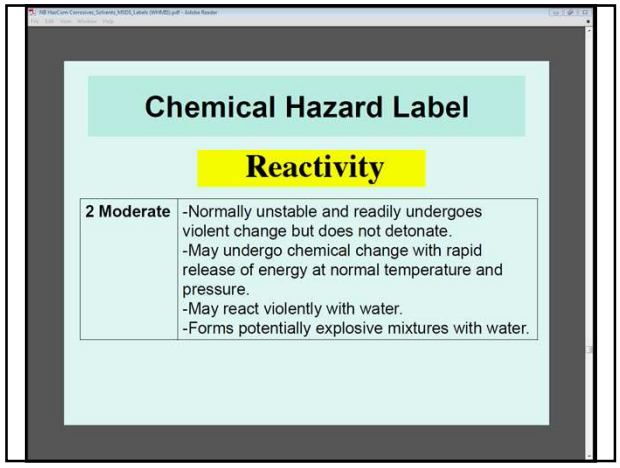

Chemical Hazard Label
Flammability
4 Extreme
Extremely. Flash point below 73 F (22.8 C)
3 Serious
-Vaporizes readily and can be ignited under almost all conditions.
-May form explosive mixtures with or burn rapidly in air.
-May burn rapidly due to self-contained oxygen.
-May ignite spontaneously in air.
-Flash point at or above 73 F (22.8 C) but less than 100 F (37.8 C).


Chemical Hazard Label
Flammability
2 Moderate
-Must be moderately heated or exposed to relatively high temperatures ---for ignition to occur.
-Solids which readily give off flammable vapors.
-Flash point at or above 100 F (37.8 C) but less than 200 F (93.4 C).
1 Slight
-Must be preheated for ignition to occur.
-Will burn in air when exposed at 1500 F (815.5 C) for 5 minutes.
-Flash point at or above 200 F (93.4 C).


Chemical Hazard Label
Flammability
0 Minimal
-Will not burn
-Will not exhibit a flash point
-Will not burn in air when exposed at 1500 F (815.5 C) for 5 minutes


Chemical Hazard Label
Reactivity
4 Extreme
-Can explode or decompose violently at normal temperature and pressure.
-Can undergo a violent self-accelerating exothermic reaction with common materials or by itself.
-May be sensitive to mechanical or local thermal shock at normal temperature and pressure.


Chemical Hazard Label
Reactivity
3 Serious
-Can detonate or explode but requires a strong initiating force or confined heating before initiation.
-Readily promotes oxidation with combustible materials and may cause fires.
-Is sensitive to thermal or mechanical shock at elevated temperatures.
-May react explosively with water without requiring heat or confinement.


Chemical Hazard Label
Reactivity
2 Moderate
-Normally unstable and readily undergoes violent change but does not detonate.
-May undergo chemical change with rapid release of energy at normal temperature and pressure.
-May react violently with water.
-Forms potentially explosive mixtures with water.

Chemical Hazard Label

Reactivity

1 Slight	-Normally stable material which can become unstable at high temperature and pressure.
0 Minimal	-Normally stable material which is not reactive with water.

NFPA / HMIS Chemical Hazard Label

Special

Updated **NFPA** Labels

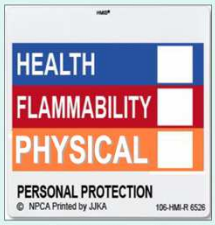
Reactivity **Instability**

Prior 1996

Current

Updated **HMIS** Labels

(HMIS® I & II)



(HMIS® III) April 2002

Personal Protective Equipment

HMIS® Letter	Required Equipment
A	Safety Glasses
B	Safety Glasses, Gloves
C	Safety Glasses, Gloves, Protective Apron
D	Face Shield, Gloves, Protective Apron

Personal Protective Equipment

E	Safety Glasses, Gloves, Dust Respirator
F	Safety Glasses, Gloves, Protective Apron, Dust Respirator
G	Safety Glasses, Gloves, Vapor Respirator
H	Splash Goggles, Gloves, Protective Apron, Vapor Respirator

Personal Protective Equipment

I	Safety Glasses	Gloves	Dust Respirator	Vapor Respirator	
J	Splash Goggles	Gloves	Protective Apron	Dust Respirator	Vapor Respirator
K	Air Line Mask or Hood	Gloves	Full Suit	Boots	
L through Z	Site-specific label. Ask your supervisor or safety specialist for handling instructions				

Compressed Gas Cylinders

If you work in the plant shop or around contractors, you may be affected by the safety of compressed gas cylinders.

You must be able to recognize unsafe cylinders and remove them from service.

P-1 3.5 Flammable gases

Indoor cylinder storage

- Well protected
- Well insulated
- Dry
- Twenty feet from flammable or combustible materials

Fuel Gas

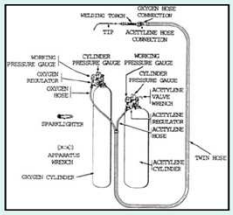
Oxygen

20 Feet

Compressed Gas Cylinders

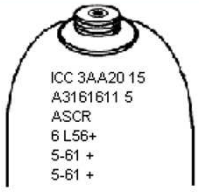
Markings are placed on the shoulder of each cylinder and provide important information.

ICC 3AA2015
A35798641
PST
6 Ø56 +
5-61 +
5-66 + *



Markings

1. MTO/DOT or an ICC marking indicating pertinent regulations
2. Serial number
3. Symbol of the manufacturer, user, or purchaser
4. Manufacture
5. retest months-month and year
6. (+) 10% overcharged
7. * 10 yrs interval



SCENARIO: **Chlorine and Diesel Fuel Spill**

An auto parts manufacturer, Apex, stores 100 gallons of chlorine, 50 gallons of # 2 type diesel fuel, and a small quantity of oils, greases, and solvents in their repair and maintains department.

The chlorine is stored in two 50 gallon above ground tanks. The chlorine is transported by an electric pump. The diesel fuel is directly adjacent to the chlorine.

WHMIS SYMBOLS

Class A - Compressed Gas

Contents under high pressure.
Cylinder may explode or burst when heated, dropped or damaged.

Class B - Flammable and Combustible Material

May catch fire when exposed to heat, spark or flame.
May burst into flames.

Class C - Oxidizing Material

May cause fire or explosion when in contact with wood, fuels or other combustible material.

Class D, Division 1 - Poisonous and Infectious Material: Immediate and serious toxic effects

Poisonous substance.
A single exposure may be fatal or cause serious or permanent damage to health.

Class D, Division 2 - Poisonous and Infectious Material: Other toxic effects

Poisonous substance.
May cause irritation.
Repeated exposure may cause cancer, birth defects, or other permanent damage.

Class D, Division 3 - Poisonous and Infectious Material: Bio-hazardous infectious materials

May cause disease or serious illness.
Drastic exposures may result in death.

Class E - Corrosive Material

Can cause burns to eyes, skin or respiratory system.

Class F - Dangerously Reactive Material

May react violently causing explosion, fire or release of toxic gases, when exposed to light, heat, vibration or extreme temperatures.

WHMIS LABELING

What is a WHMIS label?
In Canada, the WHMIS (Workplace Hazardous Material Information System) label is one of the ways health hazard information is made available to anyone using the material. Labels are required by WHMIS laws.

Why label stuff?
Labels are important because they are the first alert there may be hazards associated with using the product covered by WHMIS legislation. The labels also tell what precautions to take when using the product. In addition, labels also inform the person that there is a Material Safety Data Sheet (MSDS) available which contains more detailed information on the product.

Who is responsible for labelling?
Suppliers are responsible for labelling WHMIS-controlled products that they provide to customers. Employers and sometimes employees are all responsible for labelling or re-labelling products in the workplace, as directed in occupational health and safety legislation. This includes labelling controlled products with workplace labels, decanted products, laboratory chemicals or piping and bulk containers where a controlled product is being held or is flowing.

Are there different types of labels?
Yes. A WHMIS label can be a mark, sign, stamp, sticker, seal , ticket, tag or wrapper. It can be attached, imprinted, stencilled or embossed on the controlled product or its container. However, there are two different types that are used most often: the supplier label and the workplace label.

Is the content of supplier and workplace labels different?
There are slightly different requirements for what must be on the label depending on who is required to put the label on the product.
If a supplier label is not attached to a controlled product you are not to use the material until the supplier gives you an MSDS and a supplier label.
A **supplier label** must:
appear on all controlled products received at workplaces in Canada
contain the following information:
- product identifier (name of product)
- supplier identifier (name of company that sold it)
- a statement that an MSDS is available
- hazard symbols [the pictures of the classification(s)]
- risk phrases (words that describe the main hazards of the product)
- precautionary measures (how to work with the product safely), and
- first aid measures (what to do in an emergency)
- have all text in English and French
- have the WHMIS hatched border.

Supplier labels for materials from a laboratory supply house that are intended for use in a laboratory in amount less than 10 kg. and any controlled product sold in a container with less than 100 ml may contain less information than listed above.
If the product is always used in the container with the supplier label, no other label is required (unless the supplier label falls off or becomes unreadable). However, sometimes you will want to put some of the material into another container for use in the workplace. This new container does require a workplace WHMIS label.
A **workplace label** must:
appear on all controlled products produced in a workplace or transferred to other containers by the employer
may appear in placard form on controlled products received in bulk from a supplier
have the following information:
- product identifier (product name)
- information for the safe handling of the product
- statement that the MSDS is available

may contain the WHMIS hazard symbols or other pictograms.
These are the minimum requirements for workplace labels. The employer may wish to put more information on the labels but it is not required under the law.

Do workplace labels have to have a hatched border?
Supplier labels must have a hatched border around the information on the label but labels prepared in the workplace do not necessarily have to have hatched borders.
The Hazardous Products Act and the Controlled Products Regulations specify, among other things, what suppliers and importers are required to do with respect to MSDSs and labels. Section 20 of the Controlled Products Regulations prescribes label design requirements for supplier labels and Schedule III has a picture of how the label should look.
It is occupational health and safety legislation, not the Controlled Products Regulations, that describe what employer must do when preparing workplace labels. For example, section 10.41 on "Replacing Labels" in the Canada Occupational Safety and Health Regulations states:
"Where, in a work place, a label applied to a controlled product or a container of a controlled product becomes illegible or is removed from the controlled product or the container, the employer shall replace the label with a work place label that discloses the following information in respect of the controlled product
(a) the product identifier;
(b) the hazard information; and
(c) a statement indicating that a material safety data sheet is available in the work place."
This section does not require employers to use WHMIS symbols and a hatched border when preparing workplace labels. However, nothing in the regulations prevents an employer from using the WHMIS requirements for designing supplier labels when prepare workplace labels. Provincial OH&S legislation have similar provisions.

What happens if I put the material in a different container?
You must use a workplace label on the container. There are two special cases when a workplace label is not necessary. When a controlled material is poured into a container and it is going to be used immediately, no label is required. Also, if the material is "under the control of the person who decanted it" (which means if the person who poured it will be the only one using it) and if the material is all used during one shift, just the product identifier (name) is required. However, if the material is not used right away or if more than one person will be in control of the material, a workplace label is required. Your company may have special rules about labelling containers so you should ask about labelling policies.

What types of labels do I use if the material is shipped in bulk?
Material that is shipped in bulk also follows special rules. The tank or container that the bulk material is transferred into must be labelled with either a supplier label or a workplace label. When the material is moved into containers for resale or delivery out of your workplace, you must put a supplier label on each container. When the bulk material is used in your workplace (usually transferred into smaller containers), a workplace label is required on the containers.

Are workplace labels necessary if the material is in a pipe or reaction vessel?
Not necessarily. Pipes and reaction vessels may be marked in other ways such a colour coding, or placards. However, it is the employers duty to train workers how to recognize and interpret the markings used in your workplace.

Are labels different if I work in a laboratory?
Sometimes. Laboratory samples of controlled products that are less than 10 kilograms do not have to have a WHMIS label as long as there is a label which states the following in both English and French:
the product identifier (name)
the chemical identity or generic chemical identity of an ingredient of the controlled product, if known
the supplier identification
the statement "Hazardous Laboratory Sample. For hazard information or in an emergency, call..." and an emergency telephone number must be provided

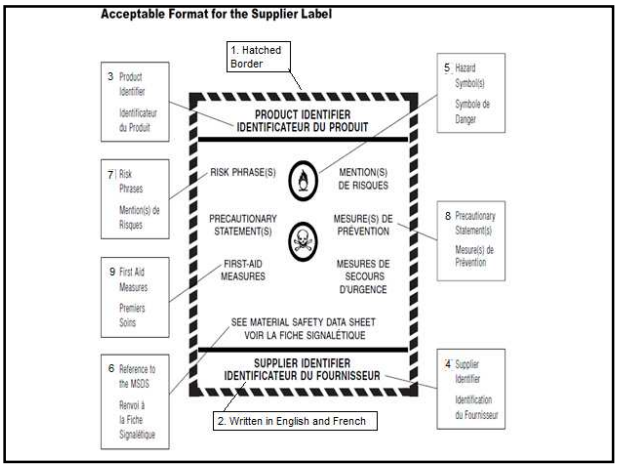
WHMIS SUPPLIER LABELS

These labels are applied, by the supplier, to a controlled product that is sold or import to a workplace in Canada. If the supplier label becomes damaged, unreadable or falls off it must be replaced with a workplace label.

Items 1-6 are mandatory and will be found on all supplier labels of any controlled product. Items 7-9 are included on supplier labels of any controlled product with a container size of more than 100ml.

1. HATCHED BORDER
2. WRITTEN IN ENGLISH AND FRENCH
3. PRODUCT IDENTIFIER
4. SUPPLIER IDENTIFIER
5. HAZARD SYMBOL(S)
6. MSDS REFERENCE
7. RISH PRASES
8. PRECAUTIONARY MEASURES
9. FIRST AID MEASURES

Acceptable Format for the Supplier Label



Supplier Label Example

Workplace Hazardous Materials Information System (WHMIS)

Occupational Health and Safety Act

Section 6

Sections and Schedules 88 – 221

Updated Jan 14 2019

TRAINING

All Advatek Systems Inc. Employees will receive WHMIS training regardless of where they will be working. This is to ensure that all employees are aware of the dangers around working with hazardous products.

MSDS sheets will be obtained for all hazardous products at Advatek Systems Inc. These will be stored in the following MSDS binders. Up front and in the service office, as well as in each company vehicle. Any employee may request to have a copy of any or all of the MSDS sheets at their desk.

WHIV1IS Classifications

WHMIS *(Workplace Hazardous Materials Information System)* uses classifications to group chemicals with similar properties or hazards. The Hazardous products Regulations specifies the criteria used to place materials within each classification. There are six (6) classes although several classes have divisions or subdivisions. Each class has a specific symbol to help people identify the hazard quickly. The classes are:

Class A - Compressed Gas

Class B - Flammable and Combustible Material

Division 1: Flammable Gas
Division 2: Flammable Liquid
Division 3: Combustible Liquid
Division 4: Flammable Solid
Division 5: Flammable Aerosol
Division 6: Reactive Flammable Material

Class C - Oxidizing Material

Class D - Poisonous and Infectious Material

Division 1: Materials causing immediate and serious toxic effects
  Subdivision A: Very toxic material
  Subdivision B: Toxic material

Division 2: Materials causing other toxic effects
  Subdivision A: Very toxic material
  Subdivision B: Toxic material

Division 3: Biohazardous Infection Material

Class E - Corrosive Material

Class F - Dangerously Reactive Material

What is a Class A - Compressed Gas?

Any material that is normally a gas which is placed under pressure or chilled, and contained by a cylinder is considered to be a compressed gas. These materials are dangerous because they are under pressure. If the cylinder is broken, the container can 'rocket' or 'torpedo' at great speeds and this is a danger to anyone standing too close. If the cylinder is heated (by fire or a rise in temperature), the gas may try to expand and the cylinder will explode. Leaking cylinders are also a danger because the gas that comes out is very cold, and it may cause frostbite if it touches your skin (for example: carbon dioxide or propane). Common examples include: compressed air, carbon dioxide, propane, oxygen, ethylene oxide, and welding gases. The hazard symbol is a picture of a cylinder or container of compressed gas surrounded by a circle.

Additional dangers may be present if the gas has other hazardous properties. For example: propane is both a compressed gas and it will burn easily. Propane would have two hazard symbols - the one for a compressed gas and another to show that it is a flammable material.

What is a Class B - Flammable and Combustible Material?

Flammable means that the material will burn or catch on fire easily at normal temperatures (below 37.8 degrees C or 100 deg F). Combustible materials must usually be heated before they will catch on fire at temperatures above normal (between 37.8 and 93.3 deg C or 100 and 200 deg **F).** Reactive flammable materials are those which may suddenly start burning when it touches air or water, or may react with air or water to make a flammable gas. The material may be a solid, liquid or gas which makes up the different divisions that fall under this class. Common examples include: propane, butane, acetylene, ethanol, acetone, turpentine, toluene, kerosene, Stoddard solvent, spray paints and varnish. The symbol for this class is a flame with a line under it inside a circle.

What is a Class C - Oxidizing Materials?

Oxygen is necessary for a fire to occur. Some chemicals can cause other materials to burn by supplying oxygen. Oxidizers do not usually burn themselves but they will either help the fire by providing more oxygen or they may cause materials that normally do not burn to suddenly catch on fire (spontaneous combustion). In some cases, a spark or flame (source of ignition) is not necessary for the material to catch on fire but only the presence of an oxidizer. Oxidizers can also be in the form of gases (oxygen, ozone), liquids (nitric acid, perchloric acid solutions) and solids (potassium permanganate, sodium chlorite). Some oxidizers such as the organic peroxide family are extremely hazardous because they will burn (they are combustible) as well as they have the ability to provide oxygen for the fire. They can have strong reactions which can result in an explosion. The symbol for oxidizing materials is an 'ro" with flames on top of it inside a circle.

What is a Class D Poisonous and Infectious Materials?

Class D materials are those which can cause harm to your body. They are divided into three major divisions.

Division 1: Materials Causing Immediate and Serious Toxic Effects

These are materials that are very poisonous and immediately dangerous to life and health. Serious health effects such as burns, loss of consciousness, coma or death within just minutes or hours after exposure are grouped in this category. Most D-1 materials will also cause longer term effects as well (those effects that are not noticed for months or years). Examples of some D-1 materials include carbon monoxide, sodium cyanide, sulphuric acid, toluene-2, 4-dilsocyanate (TDI), and acrylonitrile. The symbol for Class D - Division 1 (D-1) is a skull and crossed bones inside a circle.

Division 2: Materials Causing Other Toxic Effects

These materials are poisonous as well. Their effects are not always quick, or if the effects are immediate, they are only temporary. The materials that do not have immediate effects, however, may still have very serious consequences such as cancer, allergies, reproductive problems or harm to the baby, changes to your genes, or irritation/sensitization which have resulted from small exposures over a long period of time (chronic effects).

Division 2 of Class D has two subclasses called D2A (very toxic) and D2B (toxic). While it is not a legal requirement for the WHMIS sub-classification to be reported on the Safety Data Sheet (SDS) nor is it a requirement for classes D2A or D2B to be distinguished on the label, it is often possible to make this distinction using the health hazard information on the label and/or the SDS.

Products are typically classified as D2A (very toxic) if the chemical has been shown to be carcinogenic, embryo toxic, teratogenic, mutagenic (to reproductive cells), reproductive toxic, sensitizer (to respiratory tract) or chronic (long-term) toxicity (at low doses). Subdivision D2B (toxic) covers mutagenic (to non-reproductive cells), sensitization of the skin, skin or eye irritation, as well as chronic toxic effects.

Examples include: asbestos fibres, mercury, acetone, benzene, quartz silica (crystalline), lead and cadmium. The symbol for materials causing other toxic effects looks like a "T" with an exclamation point "!" at the bottom inside a circle.

Division 3: Biohazardous Infectious Materials

These materials are organisms or the toxins they produce that can cause diseases in people or animals. Included in this division are bacteria, viruses, fungi and parasites. As these organisms can live in body tissues and fluids, they should be treated as toxic. Urine and feces should be treated as toxic only if they are visibly contaminated with

blood. Biohazardous infectious materials are usually found in a hospital, health care facility, laboratories, veterinary practices and research facilities. Workers in these places do not usually know which tissues or fluids contain dangerous organisms. For this reason, the workers assume that every sample is dangerous and proper protection is used all the time. Examples of biohazardous infectious materials include the AIDS/HIV virus, Hepatitis B and salmonella. The symbol for this division looks like three "Cs joined together with a little circle in the middle all inside a circle.

What is a Class E Corrosive Material?

Corrosive is the name given to materials that can cause severe burns to skin and other human tissues such as the eye or **lung,** and can attack clothes and other materials including metal. Corrosives are grouped in this special class because their effects are permanent (irritants whose effects may be similar but temporary are grouped in Class D-2). Common corrosives include acids such as sulphuric and nitric acids, bases such as ammonium hydroxide and caustic soda and other materials such as ammonia gas, chlorine, and nitrogen dioxide. The symbol for a corrosive is a picture of two test tubes pouring **liquid** on a bar (piece of metal) and a hand with lines coming off of them inside a circle.

What is a Class F Dangerously Reactive Materials?

A material is considered to be dangerously reactive if it shows three different properties or abilities: first, if it can react very strongly and quickly (called "vigorously") with water to make a toxic gas; second, **if it will** react with itself when **it** gets shocked (bumped or dropped) or if the temperature or pressure increases; and thirdly, if it can vigorously join to itself (polymerization), break down (decomposition) or lose extra water such that it is a more dense material (condensation). If a material is dangerously reactive, it will most likely be described as "unstable." Most of these materials can be extremely hazardous if

they are not handled properly because they can react in such a quick manner very easily. Examples of these products are ethyl acrylate, vinyl chloride, ethylene oxide,

picric acid and anhydrous aluminum chloride. The symbol for dangerously reactive materials is a picture of a test tube with sparks or lines coming out of the tube surrounded by a letter "R" inside a circle.

****Employee Education Requirements****

The employer shall take every precaution that is reasonable in the circumstances to ensure that an employee who works with a hazardous product or in proximity to a hazardous product is instructed in the following:

- The general content required on a supplier label and workplace label, and the purpose and significance of the information contained thereon;
- The general content required on a Safety Data Sheet and the purpose and significance of the information contained thereon;
- Procedures for the safe use, storage, handling and disposal of hazardous products; and/or:
    - A pipe, or a piping system including valves,
    - A process vessel,
    - A reaction vessel, a tank car, tank truck, ore car, conveyor belt or similar conveyance;
    - Procedures to be followed where fugitive emissions are present; and
    - Procedures to be followed in case of an emergency involving a hazardous product.

Hazardous Materials not regulated by WHMIS

Yes. There are nine basic categories of materials that are not covered by WHMIS. When WHMIS was created, it was recognized that a lot of safety information was already being transmitted to workers for many of these products under other laws. To prevent delay in starting WHMIS, exclusions were made.

They are:

Consumer restricted products (those products sold to people in regular stores that are already labeled following the rules of the Hazardous Products Act)

- Explosives (as defined by the Explosives Act)
- Cosmetics, drugs, food or devices (as defined by the Food and Drug Act)

- Pest control products (pesticides, herbicides, insecticides, etc. as defined by the Pest Control Products Act)
- Radioactive materials (as defined by the Nuclear Safety and Control Act)
- Wood and products made of wood
- Manufactured articles
- Tobacco or products made of tobacco
- Hazardous wastes

Materials which fall under WHMIS follow the Transportation of Dangerous Goods Act and Regulations while they are in transport (shipment).

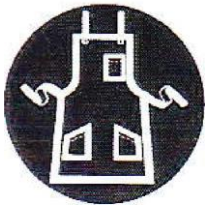
For several years, there have been proposals to make some of the above products follow the WHMIS laws. Most of the products that may be affected are the ones in categories 1, 2, 3, 4, and 5. However, there have been no changes to the WHMIS regulations yet.

These are a few of the symbols you may encounter that indicate what Personal Protective Equipment (P.P.E) must be worn when handling a particular hazardous material. This is not an exhaustive list; **if** you encounter a symbol you are unsure of contact the Safety Office for clarification.

Dust mask required -A NIOSH approved N95 dust mask must be used.

Air Purifying Respirator - A NIOSH approved chemical cartridge respirator must be used. **Use of this type of respirator requires specialized training - contact the Safety Office before using for approval and training.**

Supplied Air Respirator - A MUSH approved SCBA or Supplied Air system must be used. **Use of this type of respirator requires specialized training - contact the Safety Office before using for approval and training.**



Apron - An apron made of material resistant to the hazardous material must be worn. Consult your supervisor or the material's SDS for further information.

Chemical Protective Clothing - Either a hooded or fully-encapsulating suit of appropriate material must be worn. Consult SDS for appropriate level of protection. **Use of this type of P.P.E. requires specialized training - contact the Safety Office before using for approval and training.**

Goggles - C.S.A. approved chemical-resistant, splash-proof goggles must be worn.

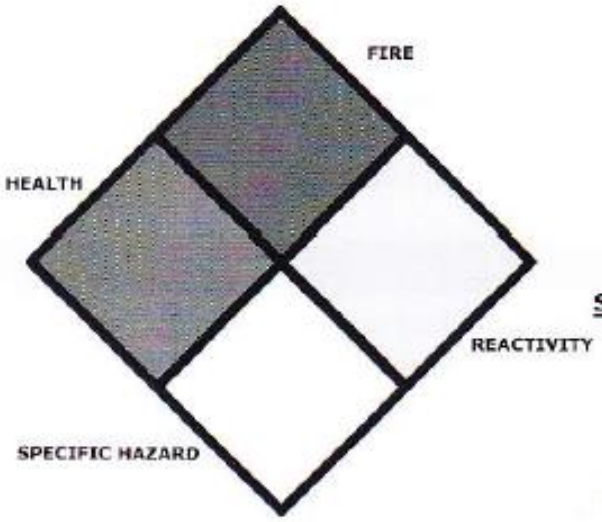
Face Shield - C.S.A. approved face shield must be worn. **Note: C.S.A. approved safety glasses or goggles must also be worn with this device.**

Foot Protection .C.S.A. approved protective footwear appropriate to the hazard must be worn.

Hand Protection .Gloves offering appropriate protection to the hazard must be worn. Consult with your supervisor of the material's SDS for further information.

Labels

This describes the NFPA Diamond on found on many workplace labels.



SPECIFIC HAZARDS

OXY - Oxidizer
ACID - Acid
ALK - Alkali
COR - Corrosive
W - Use No Water
RAD - Radioactive

Risk Number Code	Hazard	Fire Risk	Health Risk	Reactivity Risk
0	Minimal	Will not burn.	Non-hazardous.	Non-reactive.
1	Low	Flash point >93.3°C Must be pre-heated.	Slightly hazardous.	Normally stable, may become unstable if heated or may react with water, but not violently.
2	Moderate	Flash point >37.8°C but <93.3°C Must be exposed to relatively high ambient temperatures before	Intense or continued exposure could cause temporary incapacitation or possible residual injury without prompt medical	Unstable, readily undergoes violent chemical change.

		ignition can occur.	treatment.	
3	Serious	Can be ignited under almost all ambient temperature conditions.	Extremely hazardous. Short exposure could cause serious temporary or residual injury even with treatment, or could cause death.	Capable of detonation or explosive reaction, but requires a strong detonating source.
4	Extreme	Will rapidly vapourize at atmospheric pressure and normal ambient temperature, or will readily disperse in air and will burn readily.	Deadly.	May detonate.

Hazardous Material Identification System (HMIS)

Specific sections of a HMIS® label include the following:

Health

The Health section conveys the health hazards of the material. In the latest version of HMIS®, the blue Health bar has two spaces, one for an asterisk and one for a numeric hazard rating.

If present, the asterisk signifies a chronic health hazard, meaning that long-term exposure to the material could cause a health problem such as emphysema or kidney damage. NFPA lacks this important information because the NFPA system is meant only for emergency or acute (short-term) exposures.

According to NPCA, the numeric hazard assessment procedure is different than that used by NFPA. Here are the numeric rankings for the HMIS system:

4 Life-threatening, major or permanent damage may result from single or repeated overexposures.
3 Major injury likely unless prompt action is taken and medical treatment is given.
2 Temporary or minor injury may occur.
1 Irritation or minor reversible injury possible.
0 No significant risk to health.

Flammability

For HMIS I and II, the criteria used to assign numeric values (0 - low hazard to 4 = high hazard) are identical to those used by NFPA. In other words, in this category, the systems are identical.
For HMIS III, the flammability criteria are defined according to OSHA standards:

4 Flammable gases, or very volatile flammable liquids with flash points below 73 *F, and boiling points below 100 F. Materials may ignite spontaneously with air, (Class IA).
3 Materials capable of ignition under almost all normal temperature conditions. Includes flammable liquids with flash points below 73 'F and boiling points above 100 'F, as well as liquids with flash points between 73 'F and 100 "F. (Classes IB & IC).
2 Materials which must be moderately heated or exposed to high ambient temperatures before ignition will occur. Includes liquids having a flash point at or above 100 °F but below 200 F. (Classes Ii & IIIA).
1 Materials that must be preheated before ignition will occur. Includes liquids, solids and semi solids having a flash point above 200 °F. (Class 111B).
0 Materials that will not burn.

Reactivity (HMIS® I and II - now obsolete)

The criteria used to assign numeric values (0 = low hazard to 4 = high hazard) were identical to those used by NEPA. In other words, in this category, the systems were identical.

This version is now obsolete. The yellow section has been replaced with an orange section titled **Physical Hazards** - see the next section for more information.

Physical Hazard (HMIS® III)
Reactivity hazard are assessed using the OSHA criterion of physical hazard. Seven such hazard classes are recognized:

- Water Reactive
- Organic Peroxides
- Explosives
- Compressed gases
- Pyrophoric materials
- Oxidizers
- Unstable Reactives

This version replaces the now-obsolete yellow section titled Reactivity - see the previous section for more information. As with the Health and Flammability sections, the level of hazard is indicated using numeric values (0 = low hazard to 4 - high hazard):
4 Materials that are readily capable of explosive water reaction, detonation or explosive decomposition, polymerization, or self-reaction at normal temperature and pressure.
3 Materials that may form explosive mixtures with water and are capable of detonation or explosive reaction in the presence of a strong initiating source. Materials may polymerize, decompose, self-react, or undergo other chemical change at normal temperature and pressure with moderate risk of explosion.
2 Materials that are unstable and may undergo violent chemical charges at normal temperature and pressure with low risk for explosion. Materials may react violently with water or form peroxides upon exposure to air.
1 Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.
0 Materials that are normally stable, even under fire conditions, and will not react with water, polymerize, decompose , condense, or self-react. Non-explosives.

Personal Protection
This is by far the largest area of difference between the NFPA and HMW systems. In the NFPA system, the white area is used to convey special hazards whereas HMIS° uses the white section to indicate what personal protective equipment (PPE) should be used when working with the material.

Note: The NPCA specifically recommends that "preparers of SDSs should not place HMIS® PPE designation codes on the SDSs or labels that leave the facility, as they do not know the conditions under which their customers use those products." However, these still turn up on some SDS1s.
HMIS® uses a letter coding system for this section. This is problematic because it would be much clearer to see the PPE listed explicitly instead of having employees try to remember a bunch of codes or consult a chart, something that could lead to confusion and/or a fatal accident. Likewise,
the "custom codes" aspect is particularly dangerous for visitors and contractors who may not remember/recognize that these could vary from job site to job site.
Note: Some of the letters/symbols used in this table are also used as TSCA, CHIP, and/or DoD HMIRS/HCC codes, all of which have completely different meanings and applications!
Below is the lettering scheme, along with a series of graphics meant to reinforce the meaning of each letter:

HMIS® Letter	Required Equipment
A	 Safety Glasses
B	 Safety Glasses  Gloves
C	 Safety Glasses  Gloves  Protective Apron
D	 Face Shield  Gloves  Protective Apron
E	 Safety Glasses  Gloves  Dust Respirator
F	 Safety Glasses  Gloves  Protective Apron  Dust Respirator
G	 Safety Glasses  Gloves  Vapor Respirator
H	 Splash Goggles  Gloves  Protective Apron  Vapor Respirator
I	 Safety Glasses  Gloves  Dust Respirator  Vapor Respirator

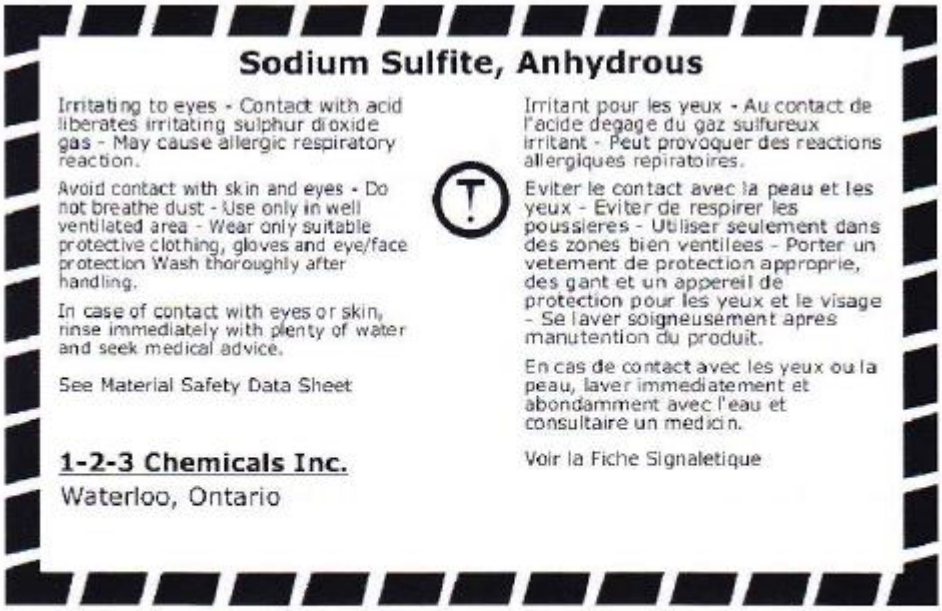
J	 Splash Goggles	 Gloves	 Protective Apron	 Dust Respirator	 Vapor Respirator
K	 Air Line Mask or Hood	 Gloves	 Full Suit	 Boots	

WHIVIIS Supplier Labels

These labels are applied, by the supplier, to a hazardous product that is sold or imported to a workplace in Canada. If the supplier label becomes damaged, unreadable or falls off it must be replaced with a workplace label. The new label must be placed on the Original containers of the hazardous product.

Items 1-6 are mandatory and will be found on the supplier label of any hazardous product. Items 7-9 are included on the supplier label of any hazardous product with a container size of more than 100m1.

Move your mouse over the menu items listed below the label to highlight the relevant section of the label.



1. **Hatched Border**
2. **Written in English and French**
3. **Product Identifier**
4. **Supplier Identifier**
5. **Hazard Symbol(s)**
6. **MSDS Reference**
7. **Risk Phrases**
8. **Precautionary Measures**
9. **First Aid Measures**

Should you transfer a hazardous product from its original container into a separate container a new workplace label must be attached to the new container. So as the product may be correctly identified.

GLOSSARY OF TERMS AND DEFINITIONS

The following glossary presents brief explanations of acronyms and common terms used and found on SDS or Sheets.

A

Acute Exposure A short-term exposure, usually occurring at high concentration.

Acute Health Effect An effect that develops either immediately or a short term after exposure.

Autoignition Temperature The minimum temperature required to initiate or cause self-sustained combustion, in the absence of a spark or flame.

B

Biohazardous Infectious Material A material that contains organisms and the toxins produced by these organisms that have been shown to cause disease or are believed to cause disease in either humans or animals.

Boiling Point The temperature at which a liquid changes from a liquid to a gas, at normal atmospheric pressure.

C

Carcinogens Agents/compounds that may induce cancer in humans.

CAS Registry Number A number assigned to a material by the Chemical Abstracts Service *(CAS)* to provide a single unique identifier.

Chemical Formula Sometimes called the molecular formula, indicates the elements that make up a chemical.

Chemical Name A proper scientific name for the active ingredient of a product.

Chronic Exposure A long-term exposure, usually occurring at low concentration.

Chronic Health Effect An effect that appears a long time after exposure.

Coefficient of Oil/Water Distribution The ratio of the solubility of the chemical in an oil to its solubility in water.

Combustible Liquid A liquid which has a flash point above 37.8°C.

Compressed Gas . A material which is a gas at normal room temperature (20°C) and pressure but is packaged as a pressurized gas, dissolved gas or gas liquefied by compression or refrigeration.

Condensation . The process of reducing from one form to another denser form such as steam to water.

Hazardous products . Under the Hazardous products Regulation, a hazardous product is defined as a material, product or substance which is imported or sold in Canada and meets the criteria for one or more of the following classes:

Class A	Compressed Gas
Class B	Flammable and Combustible Material
Class C	Oxidizing Material
Class D	Poisonous and Infectious Material
Class E	Corrosive Material
Class F	Dangerously Reactive Material

Corrosive Material . A material that can attack (corrode) metals or cause permanent damage to human tissues such as skin and eyes on contact.

Cryogenics . Materials which exist at extremely low temperatures, such as liquid nitrogen.

D

Dangerously Reactive Materials . Materials that may undergo vigorous condensation, decomposition or polymerization. They may react violently under conditions of shock or increase in pressure or temperature. They may also react vigorously with water of water vapour to release a toxic gas.

Decomposition . The breakdown of a substance, often due to heat, decay, or other effect, with the release of other compounds such as vapours or gases that may be flammable or toxic.

Density . The weight of a material in a given volume. It is usually given in grams per millilitre (gm/m1).

Dilution Ventilation . Dilution of contaminated air with uncontaminated aid in a general area, room or building for the purposes of health hazard or nuisance control, and/or for heating and cooling.

Dose . Amount of the agent that has entered the body through the various routes of entry.

E

Evaporation Rate . **The** rate at which a liquid changes to vapour at normal room temperature.

Explosive (Flammable) Limits . The lower explosive (flammable) limit (LEL) is the lowest concentration of vapour in air which will burn or explode upon contact with a source of ignition. The upper explosive (flammable) limit (UEL) is the highest concentration of vapour in air which will burn or explode upon contact with a source of ignition.

Explosive (Flammable) Range . The range between the lower explosive limit (LEL) and the upper explosive limit (UEL).

Exposure Limits . Established concentrations which, if not exceeded, will not generally cause adverse effects to the worker exposed. Exposure limits differ in name and meaning depending on origin. For example:

1) the exposure levels for the hazardous chemicals that are included in the Regulation respecting the Control of Exposure to Biological or Chemical Agents - made under the Occupational Health and Safety Act of Ontario, are expressed as follows:

> **TWAEV** . Time Weighted Average Exposure Value: **The** average airborne concentration of a biological or chemical agent to which a worker may be exposed in a work day or a work week.
>
> **STEV** . Short-Term Exposure Value: The maximum airborne concentration of a chemical or biological agent to which a worker may be exposed in any 15 minute period, provided that the TWAEV is not exceeded.
>
> **CEV** . Ceiling Exposure Value: The maximum airborne concentration of a biological or chemical agent to which a worker may be exposed at any time.
>
> **SKIN** . This notation indicates that direct or airborne contact with the product through the skin, mucous membranes or eyes. Inclusion of this notation is intended to suggest that preventative action be taken against absorption of the agent through these routes of entry.

2) Threshold Limit Values (TLVs) are exposure guidelines developed by the American Conference of Governmental Hygienists (ACGIH). They

have been adopted by several Canadian governments and others as their legal limits. They are expressed as follows:

TLV/TWA - Threshold Limit Value - Time Weighted Average: Time-weighted average concentration for a normal 8 hour work day and a 40 hour work week, to which nearly all workers may be repeatedly exposed, day after day, without adverse effects.

TLV/STEL - Threshold Limit Value - Short Term Exposure Limit: A 15 minute time-weighted average exposure which should not be exceeded at any time during a work day even if the Shr TWA is within the TLV. Exposures at the STEM should not be repeated more than 4 times a day and there should be at least 60 minutes between successive exposures at the STEL,

TLV/C - Threshold Limit Value - Ceiling: The concentration that should not be exceeded during any part of the working exposure.

F

Flammable Limits See "Explosive Limits"

Flammable Substance - One that will readily catch fire and continue to burn in air if exposed to a source of ignition.

1) **Flammable Aerosol** - A material that is packaged in an aerosol container which can release a flammable material.

2) **Flammable Gas** - A gas which can readily catch fire and continue to burn.

3) **Flammable Liquid** - A material that gives off a vapour which can readily catch fire and continue to burn, A flammable liquid has a flashpoint below 37.8°C.

4) **Flammable Solid** - A material which can readily catch fire and continue to burn vigorously and persistently. This may occur from friction, absorbing moisture, from spontaneous chemical change, or by retaining heat from manufacturing or processing.

5) **Reactive Flammable Material** - A material which is a dangerous fire risk because it can react readily with air or water.

Flashback - This occurs when a trail of flammable material is ignited by a distant source of ignition. The flame then travels back along the trail of gas, vapour or aerosol to its source.

Flash Point . The lowest temperature of a liquid at which it gives off enough vapour to form an ignitable mixture of vapour and air immediately above the surface of the liquid.

Freezing Point . The temperature at which a liquid becomes a solid, at normal atmospheric pressure.

H

Hazard . The potential for harmful effects.

Hazardous Combustion Products . Chemicals which may be formed when a material burns. These chemicals may be flammable, toxic or have other hazards.

Hazardous Decomposition Products . Formed when a material decomposes (breaks down) because it is unstable, or reacts with materials such as water or oxygen in air.

Hazardous Ingredient . Under the Hazardous Products Act, a chemical must be listed in the Hazardous ingredients section of an SDS if:

- it meets the criteria for a hazardous product,
- it is one the ingredient disclosure list,
- there is no toxicological information available, or
- the supplier has reason to believe it might be hazardous.

Hazardous Polymerization . Polymerization is a process of forming a polymer by combining large numbers of chemical units or monomers into long chains (polyethylene from ethylene or polystyrene from styrene). Uncontrolled polymerization can be extremely hazardous. Some polymerization processes can release considerable heat or can be explosive.

Ingestion . Means taking a material into the body by mouth (swallowing).

Inhalation . Means taking a material into the body by breathing it in.

Irritant . Some sort of aggravation of whatever tissue the material comes in contact with.

L

LC50 .The concentration which causes the death of 50% of a group of test animals. The material is inhaled over a set period of time, usually 4 hrs. LC stands for lethal concentration.

LD50 .The weight of material which causes the death of 50% of a group of test animals. It is usually expressed in weight of material per weight of test animal. LD stands for lethal dose.

LEL (Lower Explosive Limit) - See "Explosive Limits".

Local Exhaust Ventilation .Involves the capture of pollutants at the source.

Material Causing Immediate and Serious Toxic Effects .Classified under "Poisonous and Infectious Material" as toxic or very toxic based on information such as the LD50 or LC50.

Material Causing Other Toxic Effects .Classified under "Poisonous and Infectious Material" as a material causing toxic effects such as skin or respiratory sensitization, carcinogenicity, mutagenicity, etc.

Melting Point .The temperature at which a solid material becomes a liquid.

Mutagen .An agent that affects the genes or cells of the exposed people in such a way that it may cause cancer in the exposed individual or an undesired mutation to occur in some later generation.

N

NA Number .See "UN Number",

0

Odour Threshold The airborne concentration, usually in parts per million, at which an odour becomes detectable.

Oxidizing Material .Gives up oxygen easily or can readily oxidize other material.

P

Permissible Exposure Limits (PEL) .Legal limits in the U.S.A. set by the Occupational Safety and Health Administration (OSHA).

pH . a measure of the acidity or alkalinity of a material when dissolved in water,

Polymer A natural or man-made material formed by combining large numbers of chemical units or monomers into long chains,

Part Per Million (PPM) . Represents the concentration of gases or vapour in air. For example, **1** ppm of a gas means that 1 unit of the gas is present for every 1 million units of air.

S

Sensitization . The development, over time, of an allergic reaction to a chemical.

Solubility -The ability of a material to dissolve in water or another liquid.

Solvent . A material which is capable of dissolving another chemical,

Specific Gravity . The density of a liquid compared to the density of an equal amount of water.

Stability . The ability of a material to remain unchanged in the presence of heat, moisture or air.

T

Teratogen . Agents or compounds that a pregnant woman takes into her body that generates defects in the fetus.

TLV . See "Exposure Limits''.

Toxicity . Ability of a substance to cause harmful effects,

Trade Name . The name under which a product is commercially known.

TWA . See "Exposure Limits".

U

UEL (Upper Explosive Limits) . See "Explosive Limits".

UN Number . A four digit number assigned to a potentially hazardous material or class of materials. UN (United Nations) numbers are internationally recognized and are used by fire fighters and other emergency response personnel for identification of materials

during transportation emergencies. NA (North American) numbers are assigned by Transport Canada and the US Department of Transport to materials they consider hazardous and to which a UN number has not been assigned.

V

Vapour - A gaseous form of a material which is normally solid or liquid at room temperature and pressure.

Vapur Density - The density of a vapour compared to the density of an equal amount of air.

Vapour Pressure . The pressure of a vapour in equilibrium with its liquid or

solid form. **Ventilation** . The movement of air.

Volatility - The ability of a material to evaporate.

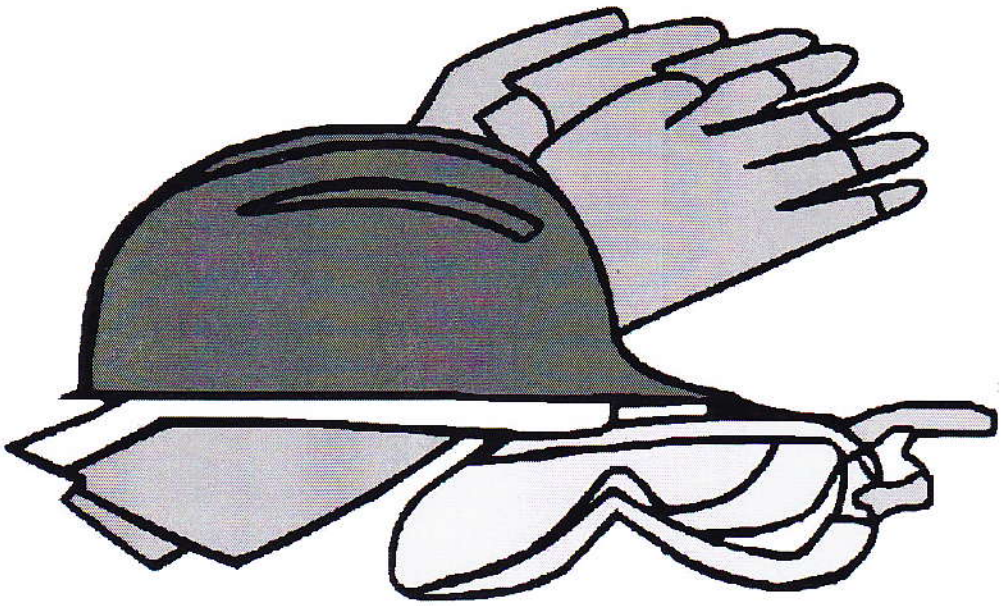
WHMIS Toxicity Categories - The adverse (acute) effects resulting from a single dose of or exposure to a material. Ordinarily used to denote effects observed in experimental animals. WHMIS categorizes chemicals as "toxic' or "very toxic".

WHMIS Class	Descriptive Term	LD50 wt/kg		LC50 4hr inhalation		
		Oral	Skin	Gas (ppm)	Vapour (ppm)	Dust (mg/L)
D Division 1 Subdivision A	Very Toxic	Below 50 mg	Below 200 mg	Below 2500	Below 1500	Below 0.5
D Division 1 Subdivision B	Toxic	5-500	200-1000		1500-2500	0.5-2.5
	Essentially non-Toxic	Above 500	Above 1000	Above 2500	Above 2500	Above 2.5

Personal Protective Equipment

Occupational Health and Safety Act

SECTION 7



CSA Certification Mark for Canada

All PPE used in the work place must meet the CSA standard enforced by the **Occupational Health and Safety Act**. Please become familiar with the following identifications:

For Canada: A CSA mark on its own, without indicators, means that the product is certified primarily for the Canadian market, to the applicable Canadian standards. If a product has features from more than one area, (e.g. electrical equipment with fuel burning features), the mark indicates compliance to all applicable Standards.

For Canada and the U.S.: A CSA mark with the indicators "C" and "US" or "NRTL/C" means that the product is certified for both the U.S. and Canadian markets, to the applicable American and Canadian standards. If a product has features from more than one area, (e.g. electrical equipment with fuel burning features), the mark indicates compliance to all applicable Standards.

NRTL/C

C US

CLASSES OF PROTECTION

One or more of the markings will appear on the outer side or the tongue of the right shoe.

PROTECTION MARKINGS	SAFETY FEATURES	RECOMMENDED USE
	Green triangle indicates sole puncture protection with a Grade 1 protective toe to withstand impacts up to 125 Joules. Comparable to a 22.7 kg (50 lb) weight dropped from 0.6 m Sole puncture protection is designed to withstand a force of not less than 1200 Newtons (270 lbs) and resist cracking after being subjected to 1.5 million flexes.	For any industry, especially construction and heavy work environments, where sharp objects, such as nails are present.
	Yellow triangle indicates sole puncture protection with a Grade 2 protective toe to withstand impacts up to 90 Joules. Comparable to a 22.7 kg (50 lb) weight dropped from 0.4 m Sole puncture protection is designed to withstand a force of not less than 1200 Newtons (270 lbs) and resist cracking after being subjected to 1.5	For light industrial work environments requiring puncture protection as well as toe protection.

	million flexes.	
	Blue rectangle indicates Grade 1 protective toe without sole puncture protection. Grade 1 protective toe withstands impacts up to 125 Joules. Comparable to a 22.7 kg (50lb) weight dropped from 0.6 m.	For industrial work environments not requiring puncture protection.
	Grey rectangle indicates Grade 2 protective toe without sole puncture protection. Grade 2 protective toe withstands impacts up to 90 Joules. Comparable to a 22.7 kg (50lb) weight dropped from 0.4 m.	For institutional and non-industrial work environments not requiring puncture protection.
	White label with green fir tree symbol indicates chainsaw protective footwear. Protective features are designed into the boots to prevent a running chainsaw from cutting all the way through the boot uppers so as to protect the shins, ankles, feet and toes.	For forestry workers and others exposed to hand-held chain saws or other cutting tools.
	White rectangle with orange Greek letter omega indicates soles that provide resistance to electric shock. Such certified footwear contains a sole and heel design assembly that, at the point of manufacturing, has electrical insulating properties intended to withstand 18,000 Volts and a leakage current not exceeding 1mA.	For any industry where accidental contact with live electrical current conductors can occur. Warning: Electrical Shock Resistance deteriorates with wear and in wet environments.
	Yellow rectangle with a green "SD" and grounding symbol indicates soles are static-dissipative. The outer soles are made from an antistatic compound, chemically bound into the bottom components, capable of	For any industry where a static discharge can create a hazard for workers or equipment.

	dissipating an electrostatic charge in a controlled manner. The test criteria are 10^6 to 10^8 Ohms. Note that SD footwear without toe protection will not have sole protection certified by CSA.	
	Red rectangle with a black "C" and grounding symbol indicates soles are electrically conductive. The outer soles are made from a conductive compound that is permanently bound to the bottom components to provide electrical grounding of each foot. Test criteria are 0 to 500 000 Ohms.	For any industry where static discharge can create a hazard of explosion.

Marking

The right foot of each pair bears the following information permanently marked in a conspicuous location:

1. Manufacturer's name, trade name, or CSA Master Contract number
2. Date of manufacture by month and year or by date code
3. Outsole construction style or name

Metatarsal Protection

Metatarsal Protection is intended to safeguard the upper foot (metatarsal bones) and toe areas. To meet CSA design requirements, the footwear must provide sufficient width and height to cover the dorsum of the foot.

***Please Note that there is no CSA certification for metatarsal protection as the standard does not currently contain performance requirements.*

General Requirements

The Company determines what PPE and type of PPE to be worn.

Protective equipment, including personal protective equipment for:

- Eyes,
- Face,
- Head and extremities,
- Protective clothing,
- Respiratory devices, and
- Protective shields and barriers.

What does the law say?

If the hazard assessment indicates the need for personal protective equipment, an employer must ensure that

a. *workers wear personal protective equipment that is correct for the hazard and protects workers,*
b. *workers properly use and wear the personal protective equipment,*
c. *the personal protective equipment is in a condition to perform the function for which it was designed, and*
d. *workers are trained in the correct use, care, limitations and assigned maintenance of the personal protective equipment.*

When Are Hard Hats Required?

If there is a foreseeable danger of injury to a worker's head at a work site and there is a significant possibility of lateral impact to the head, an employer must ensure that the worker wears industrial protective headwear that is appropriate.

Hard Hat Requirements

Protective headwear must:

- CSA Standard CAN/CSA-Z94.1-05, Industrial Protective Headwear, or
- ANSI Standard Z89.1-2003, *American National Standard for Industrial Head Protection* for Type II head protection,
- Consist of a shell and suspension that is adequate to protect a person's head against impact and against flying or falling small objects; and
- Have a shell which can withstand a dielectric strength test at 20,000 volts phase to ground.

Exemption from Wearing Headwear

If it is impractical for a worker to wear industrial protective headwear during a particular work process the worker's head is protected adequate.

Protective Footwear Requirements (CSA Standard Z195-02, Protective Footwear)

Protective footwear shall be a safety shoe or safety boot having:

- A box toe that is adequate to protect the wearer's toes against injury due to impact and is capable of resisting at least 125 joules impact; and
- A sole or insole that is adequate to protect the wearer's feet against injury due to puncture and is capable of resisting a penetration load of 1.2 kilonewtons when tested with a DIN standard pin.

Hazard Assessment

The employer shall ***assess the workplace to determine if hazards are present***, or are likely to be present, which necessitate the use of personal protective equipment (PPE).

If hazards are present, the employer shall:

- The affected employee from the hazards identified in the **hazard assessment**;
- Communicate selection decisions to each affected employee; and,
- Select PPE that properly fits each affected employee.

The employer shall verify that the required workplace hazard assessment has been performed through a written certification that identifies:

- The workplace evaluated;
- The person certifying that the evaluation has been performed;
- The date(s) of the hazard assessment; and,
- The document as a certification of hazard assessment.

Training

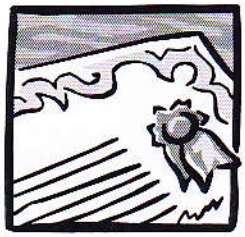
A worker required to wear protective clothing or use personal protective equipment or devices shall be adequately instructed and trained in the care and use of the clothing, equipment or device before wearing or using it.

The employer must train, which includes at least the following, employees before issuing PPE:

- When PPE is necessary;
- What PPE is necessary;
- How to properly put on, take off, adjust, and wear PPE;
- The limitations of the PPE; and,
- The proper care, maintenance,
- Useful life and disposal of the PPE.

Workers must ***demonstrate an understanding*** of the training and the ability to use PPE properly, before being allowed to perform work requiring the use of PPE.

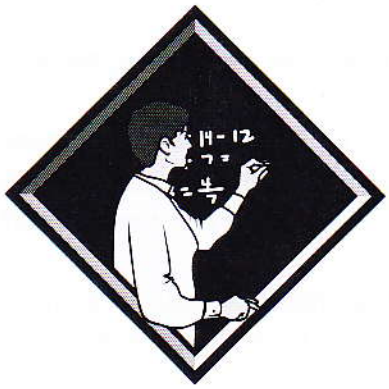
Verify that each employee has received and understood the required training through a written certification that contains:



- The name of each employee trained,
- The date(s) of training, and that
- Identifies the subject of the certification.

When Do I Need to do Re-training?

When the employer has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by Section 18, the employer must retrain each such employee. This lack of understanding may include but is not limited too:

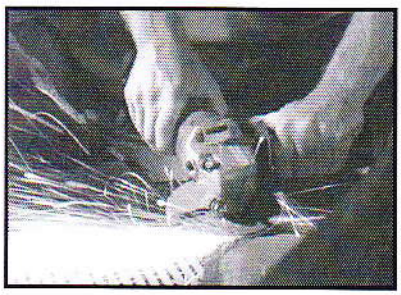


- Improper use of PPE,
- Poor maintenance of PPE,
- Improper storing of PPE,
- Sickness or symptoms of injury, and/or
- Injury.

Eye and Face Protection

Ensure that each affected employee uses appropriate eye or face protection when exposed to eye or face hazards from:

- Flying particles,
- Molten metal,
- Liquid chemicals, acids or caustic liquids, and
- Chemical gases or vapors, or potentially injurious light radiation.



Ensure that each affected employee ***uses*** eye protection that provides side protection when there is a hazard from flying objects.

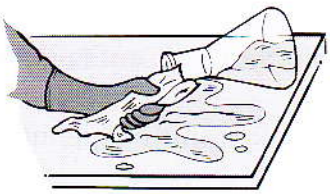
Eye and Face Protection

Ensure that each employee who wears prescription lenses while engaged in operations that involve eye hazards:

- Wears eye protection that incorporates the prescription in its design, or
- Wears eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.

Hand Protection and Selection of Hand PPE

Employers shall select and require employees to use appropriate hand protection when employee's hands are exposed to hazards such as those from:



- Skin absorption of harmful substances,
- Severe cuts or lacerations,
- Severe abrasions,
- Punctures,
- Chemical burns,
- Thermal burns, and
- Harmful temperature extremes.

Employers shall base the selection of the appropriate hand protection on:

- An evaluation of the performance characteristics of the hand protection relative to the task(s) to be performed,
- Conditions present,
- Duration of use, and
- The hazards and potential hazards identified.

1st Priority: **Engineering controls**

- Enclosure or confinement of the operation,
- General and local ventilation, and
- Substitution of less toxic materials.

Only where engineering controls are not feasible should PPE be used.

Respiratory Hazards

Where respirators are required you should have:

- A written program and determine the degree of danger and
- Worksite-specific procedures.

Required elements of your company's RPP:

- Training (annual),
- Fit testing,
- Medical evaluations,
- Care and maintenance,
- Procedures for respirator selection, and
- Procedures for routine and emergency use.

Where Respirator Use is not Required *(Voluntary Use)*

If voluntary respirator use is permissible:

- Establish and implement those elements of a written respiratory protection program. *However, a written program is not required for voluntary use.*

- Ensure that any employee using a respirator voluntarily is medically able to use that respirator.
- Ensure that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user.

Medical Evaluations (Standard Safe Practices)

- Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee.

The following are minimum requirements for employee medical evaluations:

1. Medical evaluations provided ***before***:
- Fit testing
- Worker respirator use
2. Identify a physician or other licensed health care professional to perform medical evaluations

Covering Long Hair, Loose Clothing, and Jewellery (Standard Safe Practices)

- Long hair must be covered to prevent entanglement.
- Jewellery or clothing that is loose or dangling or rings shall not be worn near any rotating shaft, spindle, gear, belt or other source of entanglement.

ADVATEK SYSTEMS INC.

Section 8

FIRST AID PROCEDURES

Updated on Dec 06 2016

ADVATEK SYSTEMS INC.

FIRST AID PROCEDURES

The following are the processes and procedures Advatek Systems Inc. employees will following in a first aid incident.

8.1 First Aid Personnel

Advatek Systems will maintain on staff at least 2 employee who are first aid qualified and current. These individuals will be made know to all other employees. Every first aid person will have access to a phone and all employee will be given access to there numbers.

8.2 First Aid Supplies

Advatek Systems will provide and stock first aid supplies in at least 2 locations in the office. Also Advatek Systems will supply each company vehicle with an emergency first aid kit. Employees must inform management by email when they have used there kit and what has been used to ensure that supplies are replenished.

8.3 Incident / Illness/ Accident

Advatek Systems requires that all employees report injuries as soon as possible to management. All employee who become ill due to activities related to their work must also report this to management as soon as possible. All injuries must be documented in an injury-illness report and held on file.

8.4 Emergency Transport

Advatek Systems requires that employees who suffer an injury that is deemed sufficient to go to an emergency care facility must be transported there in a safe manner. It is not permitted for an employee who has suffered a serious injury to transport them selves they must be transported by a second person who has first aid or Emergency Services must be notified to transport the individual to the Emergency Care Facility.

8.5 Notification of Next of Kin

Should an employee arrive at work or on site and for any reason need to be taken to an emergency care facility the following MUST occur immediately:

- If the employee is conscious and able they must **immediately** contact their next of kin that they have been taken to an emergency care facility, followed by notification to Advatek Management.
- If the employee is not able to contact the next of kin then this duty fall on the General Manager of Advatek Systems

ADVATEK SYSTEMS INC.

Section 9

CONFINED SPACES

ADVATEK SYSTEMS INC.

CONFINED SPACES

The following are the processes and procedures Advatek Systems Inc. employees will follow while working in a confined space.

9.0 References

New Brunswick General Regulation Part XVII Sec 263 - 275

9.1 Pre work Assessment

Advatek Systems requires that employees who will be working in a confined space assess the state of the confined space to ensure that there are not dangers present due to structure, equipment or wildlife. Employees are also required to notify management that they will be working in a confined space on a job site. All required PPE and rescue PPE must be made not of at this time.

9.2 Requirements

Advatek Systems requires that any one working in a confined space be accompanied by another competent person when working in a confined space, this person is NOT to enter the confined space. Several tests must be taken and documented to ensure that the confined space is safe to enter.

9.3 Safe Entry Guidelines

Advatek Systems Requires the following criteria are met & maintained while working with in the confined space

- Concentration of airborne chemical agents or airborne dust does not exceed 50% of its lower explosive limit
- Percentage of Oxygen in the atmosphere must be between 19.5% and 23%
- Above mentioned specs must be maintained during work in the confined space
- All electrical equipment with in the contained space be turned off and locked out.
- Any substances in which the employee may be hindered, stuck or drowned in must be removed
- Any hazardous substances must be removed accordingly
- Create an entry ticket

If any of the above criteria are not met or range out side the accepted limits anyone working with in the confined space must exit immediately and wait for the above criteria to be met once again.

9.4 Confined Space Entry Ticket

Advatek System require that en entry ticket be created before working in a confined space. This ticket consists of

- Results of the atmospheric testing
- Evaluation of the hazards with in the confined space
- Entry and Exit procedure for the confined space
- What Personal Protective Equipment is to be used
- Emergency plan of action
- What emergency gear is required in case a rescue is needed.
- Signed by Competent Person and Tech performing confined space work
- If the environment fails its test while occupied it must be noted on the ticket

9.5 Training

Advatek Systems requires employees receive training for working in confined spaces. Only those employees with the Confined Spaces training on their Advatek System work ticket may do confined spaces training. This training can be done either in an Advatek System training session, Advatek approved external program, or customer training requirements. If it is achieved out side and Advatek Systems training session documentation must be copied and placed into the employees file. Both the tech and the competent person must have this training.

9.6 Respiratory Hazards

Advatek Systems requires that the confined space be ventilated sufficiently to provide a safe work environment for the duration of the work. If ventilation is not feasible then the use of supplied air respirators must be enforced.

ADVATEK SYSTEMS INC.

Section 10

ELECTRICAL

ADVATEK SYSTEMS INC.

ELECTRICAL

The following are the processes and procedures Advatek Systems Inc. employees will follow while working with electrical systems.

10.0 References

Canadian Standards Association (CSA) - CSA Z462-08 Workplace Electrical Safety

10.1 Training

Advatek Systems requires that employees who will be working in with electrical systems be provided electrical awareness training. This includes identifying the type of electrical system, identifying lock and shut off points, identifying electrical voltage and current capacities. Employees who have not received this training will not be permitted to work with electrical systems.

10.2 Installation

Advatek Systems does not permit its employees to install main run AC lines. They are permitted to tie these into the systems as required but the main runs to and from panels MUST be performed by a certified electrician or customer appointed source.

10.3 Safety

Advatek Systems Requires the following items are observed and adhered to while working with electricity.

- Employees must esure that all sources of electricity must be turned off or disconnected before working on equipment.
- If and employee is working on a circuit that can be turned back on, the employee must ensure that the power can not be accidently turn back on. This can be done by labeling / covering the switch(s) with a tag stating system is under maintenance do not use.
- Employees must ensure that the equipment been used in the installation is been used in a manner in which it was designed for.
- Employees must check extension and power cords for damage before use. If damaged they are to be repaired or discarded. If they are to be repaired they must be tagged as such on both ends to prevent accidental use.
- Employees who notice defective electrical components must remove them from service and tag them as defective
- Employees shall ensure that no flammable materials are stored near electrical equipment. If it is noticed then the flammable materials are to be moved immediately.

- Employees must ensure that portable electronic equipment that is to be used outdoors or in a damp location must be protected by a GFCI (ground fault circuit interrupter).
- Employees have the right to refuse to work if they feel the electrical situation is beyond their level of capability or training.
- Employees must at all times when working with electricity be aware of the dangers associated with it

10.4 Protective Equipment

Advatek Systems requires that all employees must have access to proper PPE while working with electricity and that the PPE also be used. Advatek Systems will ensure that employees have been show what is to be used to perform their jobs.

10.5 Noted Dangers & Symbols

Please take special note of the following potential dangers

- electrical shock-" trauma caused by the passage of electric current through the body (as from contact with high voltage lines or being struck by lightning); usually involves burns and abnormal heart rhythm and unconsciousness "

- arc flash—"Arc flash temperatures can reach or exceed 35,000 °F or approx 20,000 °C at the arc terminals. The massive energy released in the fault rapidly vaporizes the metal conductors involved, blasting molten metal and expanding plasma outward with extreme force. A typical arc flash incident can be inconsequential but could conceivably easily produce a more severe explosion (see calculation below). The result of the violent event can cause destruction of equipment involved, fire, and injury not only to the worker but also to nearby people. "

ADVATEK SYSTEMS INC.

Section 11

TAG OUT, LOCK OUT

Updated November 26 2015

ADVATEK SYSTEMS INC.

TAGOUT AND LOCKOUT

The following are the processes and procedures Advatek Systems Inc. employees will follow while working with equipment that require a lock out or tag out.

11.0 References

New Brunswick General Regulation Part XVI Sec 239 - 240

11.1 Training

Advatek Systems requires that employees shall be informed and shown proper lockout and tag out procedures, as well as safety around machines

11.2 Implementation

Advatek Systems employees will tag-out or lock-out any and all equipment that may be turned on again while they are working on it. The tags and locks will bear the name of the company and the employees name. Tags are only to be removed once a job is complete and safe.

11.3 Procedure LOCK OUT/ TAG OUT apply

Advatek Systems policy is to supplement & augment, not replace any customer policy.

- **Every** Employee working on the equipment MUST perform a lock out if needed before working.
- All power sources **must** be deactivated.
- Employees will identify source for the lock out either electrical source or mechanical switch
- Employees must ensure that it is safe to lock the machine/system out at that time
- Once locked out the employee must ensure that tag is visible and secure.
- Only the employee who locked out the machine is permitted to remove the lock
- Employees may allow customer technical staff to lock out the machine using there own in house policy so long as it meets the requirements of the Advatek Systems Policy and the lock out key is kept with the employee doing the work.
- Before an employee begins work they must verify that 0 (ZERO) energy is left in the system. This process must be researched and documented before they proceed to work.

11.4 Procedure LOCK OUT/ TAG OUT removal

Advatek Systems policy is to supplement & augment, not replace any customer policy.

- When the work is complete the employee must ensure that their work area is cleared and safe
- The employee must ensure no one else is working on the machine, even if no other locks are present
- Should an employee lock need to be removed before the employee is finished the employee must ensure that the system they are working on does not pose any safety risk to other employee or themselves during the time of the force removal. This is to be noted in the work order.
- See Section 11.6 for full step by step of what to do when removing another persons lock out.

11.5 In Process Maintenance

At no time shall an Advatek Systems employee work on any equipment while in operation other than low voltage DC circuits for testing purposes only.

11.6 Removal of Another persons lock out

1. Determine who the lock belongs to
2. Contact that person
3. If they are not available contact their supervisor to check to see if the site is indeed safe for use
4. The supervisor will then ensure the site is clean and all guards are in place & remove all tools and debris
5. Clear the area of all employees before removing the lock to ensure no one may be harmed if the machine / device is not actually ready
6. Remove & keep the lock
7. Make note of the lock removal on your work order
8. You may now start the machine
9. If the system fails, place you lock back on to close the system until proper repairs can be made

ADVATEK SYSTEMS INC.

Section 12

MACHINE CONTACT

ADVATEK SYSTEMS INC.

MACHINE CONTACT

The following are the processes and procedures Advatek Systems Inc. employees will follow while working with near machinery

12.0 References

New Brunswick General Regulation Part XVI Sec 241

12.1 Training

Advatek Systems requires that employees shall be informed of the policy on machine contact

12.2 Implementation

Advatek Systems employees requires that employees observe the following guidelines while working near machines.

- Employees shall ensure that all clothing is worn securely and not hanging loose.
- Employees shall ensure that any additional bags or boxes are not to have loose hanging straps
- Employees shall ensure that all machine moving parts are guarded. If not this is to be reported to the site supervisor and email to management
- Employees shall NEVER knowingly tamper with safeguards on any machine.

ADVATEK SYSTEMS INC.

Section 13

NOISE

ADVATEK SYSTEMS INC.

NOISE

The following are the processes and procedures Advatek Systems Inc. employees will follow while working with in areas of high noise

13.0 References

New Brunswick General Regulation Part V Sec 29-33.1

13.1 Training

Advatek Systems requires that employees shall be informed and trained on noise & ear protection

13.2 Implementation

Advatek Systems employees requires that employees observe the following guidelines while working near areas of high noise.

- Employees while onsite will abide by posted signage for ear protection
- Employees entering an area where NOISE may be an issue should conduct a noise survey, result will be documented
- Employee will not be subjected to NOISE levels above 85db for more than 7.5 hours straight
- Advatek System will use where possible engineering controls where possible to reduce the noise levels
- If engineering controls are not possible then the employee is require to wear appropriate ear protection.

ADVATEK SYSTEMS INC.

Section 14

WORKING ALONE

ADVATEK SYSTEMS INC.

WORKING ALONE

The following are the processes and procedures Advatek Systems Inc. employees will follow while working alone

14.0 References

New Brunswick Working Alone Regulation Sec 3-4

14.1 Training

Advatek Systems requires that employees shall be informed and trained on working alone

14.2 Implementation

Advatek Systems employees requires that employees observe the following guidelines while working alone

- Employees must perform a risk assessment to ensure that working alone does not pose an unsafe risk of injury, and to identify what control measure must be inplace
- Employee working alone are required to keep on there person a method of communicating in case they need to call for help. This can be a Cell Phone or Electronic tracking device
- Employee must ensure that management is aware that they are working alone at a job site and an approximate time for a check in once complete
- If an employees checking in time passes management must attempt to contact the employee
- If contact is not made then then management must contact the site and attempt to locate the employee based of the job they were doing.

ADVATEK SYSTEMS INC.

THERMAL EXPOSURE

SECTION 15

15.1 Thermal Exposure Limits

Employees at Advatek Systems are required to be aware of the environment in which they work. During the summer Employee's are required to keep water with them at all times and are also instructed in the signs of heat exhaustion. Employees are also told to adjust their activities while outdoors or exposed to temperatures greater than 24.0 Celsius or Less than 15.0 Celsius. During the winter months Employees are required to wear clothing that adequately protects them from the cold as well as having a heated space for them to warm up in. They are also instructed in the signs of hypothermia.

15.1.1 Heat Stroke

"While symptoms can vary from person to person, the warning signs of heat stroke can include complaints of sudden and severe fatigue, nausea, dizziness, light-headedness, and may or may not include sweating. If a co-worker appears to be disorientated or confused (including euphoria), or has unaccountable irritability, malaise or flu-like symptoms, the worker should be moved to a cool location and seek medical advice. "

15.1.2 Hypothermia

"Warning signs of hypothermia can include complaints of nausea, fatigue, dizziness, irritability or euphoria. Workers can also experience pain in their extremities (hands, feet, ears, etc), and severe shivering. Workers should be moved to a heated shelter and seek medical advice when appropriate. "

Should employees be exposed to working conditions that may present a risk of exposure to extreme heat or cold Advatek Systems will ensure that.

- A Competent person measures (this can be the working employee) and records the thermal conditions at a regular interval not to exceed 1.5 hours
- Thermal condition findings will be recorded so they can be later reviewed
- The ACCGIH threshold limit values must also be adhered to (Table 1 & 2)
- Work-Rest regiments for thermal exposure will also be followed. (Table 3)
- Working out doors during spring, summer & fall SPF 30 or greater sunscreen must be used.

Even though Employees at Advatek Systems don't normally work in extreme colds the following must be done. Wind Chill must be considered at all times. Employees working in cold zones such as coolers/freezers or out doors must:

- From 10-15 Celsius Limit exposure to 2 hour before moving to a warm zone for at least 5 minutes
- From 0 to 10 Celsius Limit exposure to 1 hours before moving to a warm zone for at least 10 minutes
- From –15 to 0 Celsius Limit exposure to 30 before moving to a warm zone for at least 15 minutes
- Below –15 Celsius Limit exposure to 30 before **resting** in a warm zone for at least 15 minutes
- Below –30 no work is to be done
- When working below 0 Celsius workers must wear a winter rated jacket, gloves, hat and face protection
- When working below –15 Celsius employees are also required to wear winter pants

- When wind is an issue wind breaker clothing should also be worn, Be aware of the windchill value as this does alter the working tempurature
- If working alone at temperatures below 5 Celsius you must report into base at least every hour, should you fail to report Advatek Systems will contact the worksite to locate you, and dispatch emergency services if required
- Ensure you have a warm zone to go to. This can be your company vehicle with heat running. It is preferred to be a building where you can go inside and rest.

Even though Employees at Advatek Systems don't normally work in extreme heats the following must be done. Employees working in hot zones such as near ovens or boilers or out doors must:

- Between 15-28 Celsius all work can be conduct normally while consuming plenty of water and resting at normal rate
- From 28 to 35 Celsius Limit work to medium/light duty, while drinking plenty of water and resting for at least 15 minutes every 2 hours
- From 35 Celsius and up Limit work, while drinking plenty of water and resting for at least 15 minutes every 1 hour
- Be aware of the Humidex value as this does alter the working temperature.
- Ensure you have a cool zone to go to. This can be your company vehicle with AC running. It is preferred to be a building where you can go inside and rest.
- Wear clothing appropriate to the weather while wearing appropriate PPE

Table 1
ACGIH Screening Criteria for Heat Stress Exposure (WBGT values in °C) for 8 hour work day five days per week with conventional breaks

Allocation of Work in a Work/ Rest Cycle	Acclimatized				Action Limit (Un-acclimatized)			
	Light	Moderate	Heavy	Very Heavy	Light	Moderate	Heavy	Very Heavy
75-100%	31.0	28.0	--	--	28.0	25.0	--	--
50-75%	31.0	29.0	27.5	--	28.5	26.0	24.0	--
25-50%	32.0	30.0	29.0	28.0	29.5	27.0	25.5	24.5
0-25%	32.5	31.5	30.5	30.0	30.0	29.0	28.0	27.0

Table 2
Humidex and Thermal Comfort

Humidex Range (°C)	Degrees of Comfort
20 - 29	Comfortable
30 - 39	Varying degrees of discomfort
40 - 45	Uncomfortable
46 and Over	Many types of labour must be restricted

Table 3
Canadian health and safety regulations with respect to thermal conditions in the workplace

Jurisdiction	Regulation	Temperature
Canada, Federal	Personal service food preparation area Materials handling: operators' compartment First aid room	18°C min./29°C max. 27°C max. 21°C - 24°C ACGIH TLVs for heat stress, cold stress
Treasury Board Guidelines	Thermal conditions in office work	20-26°C Humidex 41°C max.
British Columbia	Heat Stress Regulations Indoor Air Quality Regulation, ASHRAE 55 -1992 Standard	Limits in WBGT units similar to ACGIH TLV
	Summer Indoor Winter Indoor	23.3 - 27.2°C or 74 - 81°F 20.5 - 24.4°C or 69 - 76°F
Alberta	(Guidelines only)	similar to ACGIH TLVs for heat stress and cold stress
Saskatchewan	Thermal environment	Reasonable and appropriate to nature of work
Manitoba	Thermal environment	ACGIH TLVs for heat stress, cold stress
Ontario	Construction projects:	
	Change room for underground workers Work chamber Medical locks	27°C min. 38°C max. 18°C min./27°C max.
	Enclosed workplace, Industrial Establishment Regulations	18°C min.
Quebec	Safety in mines: Dryhouse temperature Occupational exposure limits	22°C min. WBGT similar to ACGIH TLVs

New Brunswick	Enclosed place of employment:	
	Light work while sitting, mental work	20°C min.
	Light work while sitting, work with small	18°C min
	Moderate physical work, standing	16°C
	Heavy physical work	12°C min.
	Work conditions	1997 ACGIH TLVs for heat stress and cold
Nova Scotia	Construction safety regulations: Working chamber	27°C (80°F) max. ACGIH TLVs for heat stress and cold
Prince Edward Island	Enclosed workplace:	
	Light work while sitting, mental work	20°C min.
	Light work while sitting, work with	19°C
	Light work, standing	17°C
	Moderate work standing	16°C
	Heavy work	12°C min.
	Occupational exposure limit	ACGIH TLVs for heat and cold exposure
Newfoundland and Labrador	Occupational exposure limit	ACGIH TLVs for hot and cold environment
Northwest Territories	Overnight minimum temperature only,	18°C min
Nunavut	Overnight minimum temperature only,	18°C min
Yukon Territory	Thermal environment	Heat Stress limits similar to ACGIH TLVs

Assumes 8-hour workdays in a 5-day workweek with conventional breaks.

TLVs assume that workers exposed to these conditions are adequately hydrated, are not taking medication, are wearing lightweight clothing, and are in generally good health.

ADVATEK SYSTEMS INC.

WORKPLACE

HOT WORK

SECTION 16

Updated Jan 13 2014

ADVATEK SYSTEMS INC.

HOT WORK

Advatek Systems Inc. has the following policies pertaining to hot work (welding, cutting, soldering)

1) All Hot work must be approved by the customer
2) A hot work permit must be completed before performing hot work
3) Employees must wear the correct PPE at all times for the job they are performing
4) No employee shall commence a welding, cutting, burning or soldering operation unless the employee has thoroughly inspected the entire area surrounding the area around the operation to ensure that all combustible, flammable, or explosive material, dust, gas or vapour has been removed from the area, if possible, or that adequate precautions have been taken to prevent fire or explosion
5) Advatek Systems shall not permit any welding, cutting, burning, or soldering operation until the precautions identified have been carried out
6) Advatek Systems and the employee shall each ensure that suitable fire extinguishing equipment in good working order is readily available where any welding, cutting, burning or soldering operation or any other allied process using heat application is performed.
7) Employees will not perform any welding or torch cutting on site. Welders or Cutters must be provided hiring a certified contractor or using the sites certified personnel.
8) Employees are permitted with clearance from the customer to utilize portable hand torches for the purposes of loosening fused equipment for repairs. The Employee must ensure all connections are secure and safe for operation on the torch prior to starting work
9) All equipment must be handled and store correctly, and any gas cylinders are to be handled according to WHMIS training.
10) Employees shall listen and obey the directions given by the worker performing the hot work, and follow all safety policies and procedures as dictated to them.
11) Employees shall be aware of any dangers and work to minimize any possible harm. Such as moving flammable material away from the hot work area should any be noticed by the Employee that may have been missed by the Individual performing the hot work.
12) Advatek Systems shall ensure that an employee working in the area and not engaged in a welding, cutting, burning or soldering operation is protected from harmful radiation by providing adequate screening around the operation or by preventing the employee's entry to the area where the operation is being conducted.
13) Advatek Systems does not permit its employees to work on any containers that would have housed explosive or flammable substances
14) Employees will ensure connections between the cylinder, hose, and regulator are inspected and tested for leaks before operation

15) Advatek Systems Inc. and employees shall ensure that a portable compressed gas container is stored:

a. in a well ventilated and dry storage area where the temperature does not exceed 52°C,
b. with containers grouped by types of gas and the groups arranged to take into account the gases contained,
c. with full and empty containers in separate areas, and
d. secure and upright.

16) Advatek Systems Inc. and employees shall each ensure that a portable compressed gas container:

a. is not stored near readily ignitable substances,
b. is kept at a safe distance from all operations that produce flames, sparks, or molten metal or result in excessive heating of the container,
c. is not exposed to corrosive materials or corrosion-aiding substances, and
d. is protected from falling and from having heavy objects fall on it

ADVATEK SYSTEMS INC.

WORKPLACE

RISH ASSESSMENT

SECTION 17

Updated Jan 13 2014

ADVATEK SYSTEMS INC.

RISK ASSESSMENT POLICY

The following are the policy & practices for on site risk assessment prior to starting work. These policy and practices are to be used any time an employee is going on site to perform work. **This training is mandatory for all staff & contractors.**

Section 17.1 Identify the hazards

A. Upon arriving on job site the employee, contractors will identify what hazards exist (what can hurt you)

B. Assign a **Frequency** (how often will I encounter this hazard) **Grid B**

C. Assign a **Occurrence** (how likely is it to happen) **Grid C**

D. Calculate **Possibility** of the hazard using **Grid D** below

E. Assign a **Severity** (how badly will it hurt me / others) **Grid E**

F. Calculate the **Risk** of injury using Severity from (E) and Probability from (D) in **Grid F**

G. The resulting value is the Risk of injury **Grid G**

H. Once complete the employee should do what is required to stay safe. Put in place what ever controls are needed to prevent the hazard or mitigate the risk to an acceptable level.

Example: Jane works as a flag person on the road what hazards and risks would she face.

On a back country road low speed limit

Hazard = Been hit by a passing car

Frequency = 1

Occurrence = 4

Possibility = B

Severity = 3

Risk Level = 9 (Moderate Risk—Take precaution … PPE)

On a primary highway near major city center, high speed limit

Hazard = Been hit by a passing car

Frequency = 1

Occurrence = 1

Possibility = A

Severity = 1

Risk Level = 1 (High Risk— Precaution, Add a bumper truck at site and pylons at least 1 KM in advance of work)

GRID B	
Frequency	**Occurrence**
1. Continuous	1. Very Likely (has happened or expected to)
2. Frequent (Daily)	2. Likely (probable—it could happen)
3. Occasional (once per week)	3. Rare (seldom but possible)
4. Unusual (once per month)	4. Very Rare (very seldom but possible)
5. Rare (few per year)	5. Very unlikely (slight possibility)
6. Very Rare (yearly or less)	6. Practically impossible

GRID C	
Frequency	**Occurrence**
1. Continuous	1. Very Likely (has happened or expected to)
2. Frequent (Daily)	2. Likely (probable—it could happen)
3. Occasional (once per week)	3. Rare (seldom but possible)
4. Unusual (once per month)	4. Very Rare (very seldom but possible)
5. Rare (few per year)	5. Very unlikely (slight possibility)
6. Very Rare (yearly or less)	6. Practically impossible

GRID E	
Frequency	**Occurrence**
1. Continuous	1. Very Likely (has happened or expected to)
2. Frequent (Daily)	2. Likely (probable—it could happen)
3. Occasional (once per week)	3. Rare (seldom but possible)
4. Unusual (once per month)	4. Very Rare (very seldom but possible)
5. Rare (few per year)	5. Very unlikely (slight possibility)
6. Very Rare (yearly or less)	6. Practically impossible

Occurrence

Frequency	**1**	**2**	**3**	**4**	**5**	**6**
1	A	A	B	C	C	D
2	A	B	B	C	D	D
3	B	B	C	D	D	D
4	B	C	C	D	D	E
5	C	C	D	D	E	E
6	C	D	D	E	E	E

Grid D (PROBABILITY OF HARM)

Probability

Severity	**A**	**B**	**C**	**D**	**E**
1	1	2	4	7	11
2	3	5	8	12	16
3	6	9	13	17	20
4	10	14	18	21	23
5	15	19	22	24	25

Grid F (RISK LEVEL)

Risk Level	Assesment
HIGH 1—6	Serious or significant hazard—a high priority for immediate control or elimination
MODERATE 7—15	Moderate hazard—medium priority for control as soon as possible
Low 16 +	Minor hazard—lower priority for control after higher priorities

ADVATEK SYSTEMS INC.

Workplace Violence and Harassment

SECTION 18

Updated Jan 13 2014

ADVATEK SYSTEMS INC.

Workplace Violence and Harassment

Definitions

“Violence”, in a place of employment, means the attempted or actual use of physical force against an employee, or any threatening statement or behaviour that gives an employee reasonable cause to believe that physical force will be used against the employee, and includes sexual violence, intimate partner violence and domestic violence.

“Harassment”, in a place of employment, means any objectionable or offensive behaviour that is known or ought reasonably to be known to be unwelcome, including bullying or any other conduct, comment or display made on either a one-time or repeated basis that threatens the health or safety of an employee, and includes sexual harassment, but does not include reasonable conduct of an employer in respect of the management and direction of employees at the place of employment.

Ref. New Brunswick General Regulation Part 1 Sec 2

An employer shall assess the risk of violence at the place of employment and shall ensure that the assessment is documented and made available to all committees, if any, or all health and safety representatives, if any, and to an officer on request. The employer shall review the assessment of the risk of violence and update it when there is a change in conditions at the place of employment, or when ordered to do so by an officer.

Ref. New Brunswick General Regulation Part XXII.I Sec 374.1 (1)

Reporting

All employees shall feel free to report any incident to their supervisor or manager. Should the imideate supervisor or manager be the source of the harassment the employee is free to report their supers.

To report harassment the employee shall:

- Make record of the incident
- Report the incident

A code of practice for harassment shall include a statement that an employee shall report an incident of harassment to the employer as soon as the circumstances permit.

Ref. New Brunswick General Regulation Part XXII.I Sec 374.3 (1) (e), 374.4 (1) (2) (c)

An employer shall implement a training program in respect of the code of practice for harassment established for each employee and for each supervisor who is responsible for an employee.

Ref. New Brunswick General Regulation Part XXII.I Sec 374.7 (1)

ADVATEK SYSTEMS INC.

WORKPLACE

PANDEMIC RESPONSE

SECTION 18

Updated Oct 23 2014

Advatek Systems Inc
Pandemic Response

The following are the policies and practices for managing a pandemic breakout. These policies and practices are to be user any time a pandemic is predicted or is in effect.

Plan Manager:
The pandemic response plan is the responsibility of the General Manager who will action the Office Manager to communicate the plan to the entire staff.

Elevated Hygiene Controls:
During a Pandemic it is important that all employees maintain a higher level of personal hygiene. Hand washing and use of hand sanitizers is encouraged. Hand Sanitizer & station sanitizer is provided for use, alcohol based or what is recommended for the outbreak. Remember to properly wash your hands after use of the washroom facilities and to clear the common surfaces. **Hand washing remains one of the most effective way to prevent the spread of contagions, wash often wash fully.**

illness prevention:
Employees are trained during on boarding on health issues of the pertinent disease to include prevention of illness, initial disease symptoms, preventing the spread of the disease, and when it is appropriate to return to work after illness. Disease containment plans and expectations should be shared with employees. Communicating information with non-English speaking employees or those with disabilities must be considered. This is also communicated yearly during the safety review.

Office controls:
As per directives, Advatek's office is to have no more than 10 people in side at any one time. All staff will sanitize their work spaces at the start and end of the day. The first person in and last person out shall clean all door handles and common surfaces. In shared office space social distancing is to be maintained as such in the service office you will only be permitted 3 staff members at one time.

Desk phones:
Personal assigned phones are to be cleaned at the start of the day. Shared phones cleaned between uses.

Co Travel:
As per directives co-travel inside NB is permitted if the passenger is seated in the rear passenger seat. The driver and passenger will sanitize all touched common surfaces before and after. Wearing of masks is also required. This is only suggested for short distance travel such as to take a tech to get their vehicle from the service shop, as going with a co-worker is lower risk than using a taxi.

Shop and tool controls:
All tools are too be cleaned before been placed back into the tool cabinets. This way we can treat the tool cabinet as clean zone. If you are to pick up tool from a desk it is to be sanitized prior to use. Techs who require to work in proximity for a job must wear one of the provided masks

Shipping and drop off & customer visit:
Customers are not currently permitted to visit Advatek systems. The side man door will remain locked access to the building via back door only. Upon arrival all employees will sanitize their hands. Any customer drop offs are to be done in the roped off zone. Customer may enter and stay within the roped of zone if discussion with staff is required. Couriers are to drop off inside the roped of zone. Only 1 customer is permitted in the zone at any one time.

Signatures:
At this time and until further notice signatures for pick up, drop off or work orders is not required.

Sickness:
Should you feel ill you are **required** to stay home, if you are presenting with listed symptoms call 811 for guidance and inform your manager via e-mail. Even if you are tested and cleared if you are experiencing any flu like symptoms you are required to stay home.
A fever monitoring is as follows:

- Less than or equal to 37.4 c OK,
- Greater than 37.4 but less than 38c monitor extra times per day
- Equal to or Greater than 38 you have a fever stay home, call 811, notify your supervisor

Awareness & Immunization
Employees will be made aware of health issues relating to any pertinent disease to include prevention of illness, initial disease symptoms, preventing the spread of the disease, and when it is appropriate to return to work after illness. Disease containment plans and expectations should be shared with employees. Efforts will be made to communicate effectively with all employees. Should an immunization program become available all staff are asked to please take up the opportunity to get immunized.

Typical Symptoms: (May differ depending on Pandemic)

- Most common symptoms:
  - fever
  - dry cough
  - tiredness
- Less common symptoms:
  - aches and pains
  - sore throat
  - diarrhea
  - conjunctivitis
  - headache
  - loss of taste or smell
  - a rash on skin, or discoloration of fingers or toes
- Serious symptoms:
  - difficulty breathing or shortness of breath
  - chest pain or pressure
  - loss of speech or movement

Reduction of office Staff & work from home:
Depending on the pandemic severity level as dictated by the province Advatek will limit its staffing levels in the office. Those that can will be required to work from home. Those in the office will be required to maintain distancing. Should you be ill or required to isolate all efforts will be made to help the employee work from home if able. Staff are also encouraged to avoid work or pleasure in large, crowded areas during a time of pandemic as instructed by the provincial health authorities.

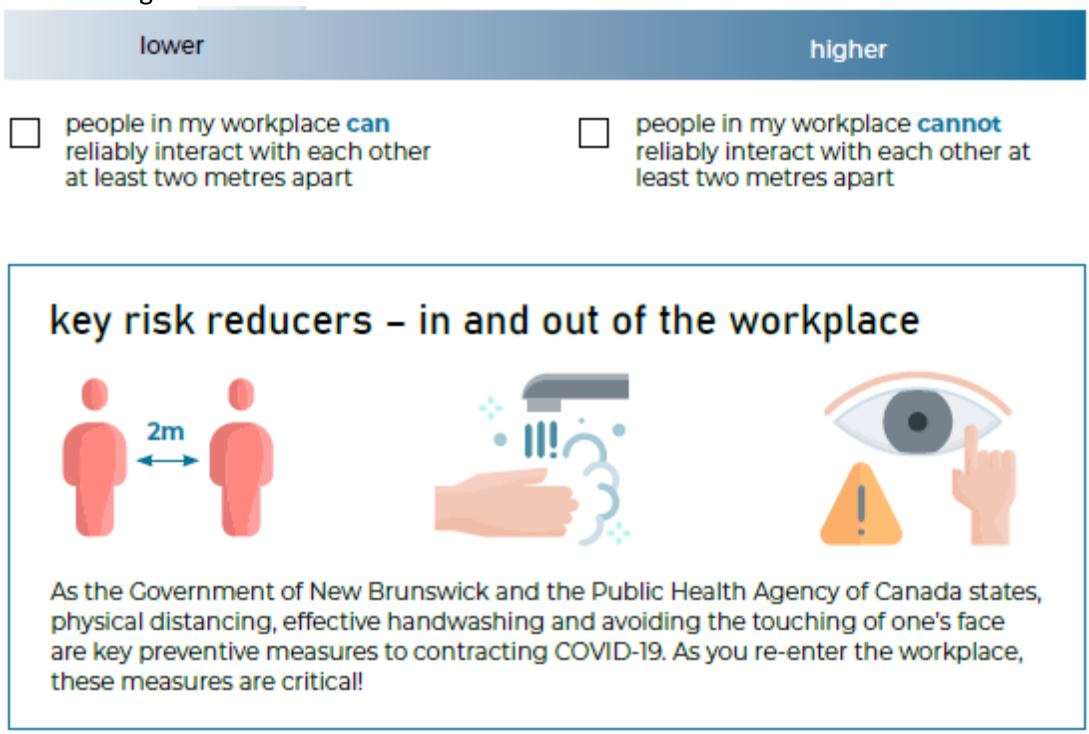
PANDEMIC

Server/Lockdown Red / Orange - Max 5 office staff
Moderate Yellow – Max 10 office staff

Critical Impact
Should a sudden increase in illness start affecting the staff work from home will be enforce for all but 1 employee who will work from the office to allow for the answering of phone and shipping & receiving. Technicians will be asked to take work home as possible to work from home. All staff are setup on the company VPN and have cell phones to communicate. Should work need to be done at the office steps will be taken to ensure no contact between employees.

Communications:
All staff are asked to forward any question to their supervisor. Should they be approached by the media they are to forward the request to management. Management has an open door/communication policy for ease of communication. All communication to the customer will be handled by management. Should any illness break out at the company and we would have visited customers during the 'infectious' period customer will be notified by email. Customer will be notified via email and by signage posted as require by local health authority.

Service Work:
While on site at a customer location staff will be required to maintain distancing as per the guidelines. If not possible then the wearing of gloves and masks is required. Along with the increased sanitization of common touch area. All techs coming back from out of province work are required to self-monitor this includes taking your temperature daily to ensure you are not running a fever.



Common Area's & work surfaces:
Areas such as the lunch area, microwave, fridge and the like are to be cleaned between uses. All work surfaces are to be cleaned twice a day with approved disinfectant. These work surfaces are to be cleaned periodically and as directed by local health authorities.

Plan & Review:
This plan is to be reviewed yearly along with the workplace safety manual. Testing of the processes happens as part of daily work, such as VPN and working from home.

Travel:
All Advatek staff will be required to have with them all items as required in the **COVID-19 Check list**

PERSONS NOT REQUIRED TO SELF-ISOLATE

Certain persons are permitted to enter New Brunswick and are not required to self-isolate:

1. Those who demonstrate they are travelling through to another jurisdiction and who agree to limit stops to food, fuel and personal needs, and agree to follow the guidance of the Chief Medical Officer of Health.
2. Workers who are healthy and:
   a. provide or support things essential to the health, safety, security or economic well-being of New Brunswickers, including:
      i. commercial transportation of goods by truck, train and plane.
      ii. maintenance of critical infrastructure telecommunications, transportation, data, fuel, electricity, manufacturing, water and wastewater, health and financial systems **that is urgent and unplanned and where New Brunswick services are not available.**
   b. live in or near an interprovincial border community and commute to and from work locally, where the person lives in one province and works or operates a business in another.

Changes:

Any changes will be sent by Jason Forster to the team via email, requiring a read receipt to be sent this will work as your conformation you have read the updates.

every WORKPLACE

what you need to do, no matter the risk level

Your responsibility as an employer is to take every reasonable precaution to ensure the health and safety of your employees. Ensuring that your employees and supervisors understand their responsibilities to minimize exposure to COVID-19 is essential for maintaining a safe workplace. You're also obligated to ensure your entire team understands and complies with the safety measures you have put in place. No matter what your risk level and choice of measures, training, communication and documentation are critical to prevent the transmission of COVID-19.

STAY INFORMED

Be attentive to changes. Watch and listen to reliable information outlets, such as the Government of New Brunswick, Public Health Agency of Canada and WorkSafeNB. Comply with mandatory orders issued by Public Safety and any applicable directives and guidelines from Public Health.

INVOLVE YOUR STAFF

Consult with staff, your joint health and safety committee or employee health and safety representative, as appropriate. Your employees can help with many aspects of communication, support and more.

COMMUNICATE

Inform your supervisors and employees of their rights and responsibilities to reduce the risk of COVID-19 exposure. Regularly communicate with your employees the importance of protecting themselves and others from COVID-19, changes to processes and procedures, and why these changes are required.

PREPARE FOR AN EXPOSURE

If an employee tests positive for COVID-19, Public Health will provide them with clear direction, including steps they must take. Public Health may also contact the employer and other employees to provide direction, if necessary.

CREATE A COVID-19 OPERATIONAL PLAN

You must have a documented plan that specifically addresses COVID-19. This requirement applies to all workplaces, whether you have continued to operate during the pandemic or are planning your re-opening. **While your documented plan doesn't need to be approved by WorkSafeNB or Public Health, it needs to be available at any time.** You could be asked for it by either regulatory body.

Deficiencies and Improvements:
Should any deficiencies be found or any way to improve the plan be suggested, it would then go into a review to see if we can implement this effectively and efficiently. Changes to the plan and procedure will be published into the company work safe policy. Post pandemic this plan will be reviewed to validate is effectiveness deficiencies will be noted and process updated.

There are no exceptions and all staff & Management will be held to account.

This plan is been rolled into our standing safety program as a permanent addition for Pandemic response

Roll out schedule:
Covid-19 March 15 2020 – On Going – Plan is working as implemented at this time (2020/Oct/2)

ADVATEK SYSTEMS INC.

Enviromental Sustainability

SECTION 20

Updated Jan 13 2024

ADVATEK SYSTEMS INC.

Environmental Sustainability

20.1

Advatek is committed to ensuring a minimal impact to global and local environment by sourcing and using equipment and products produced or manufactured from other environmentally conscious countries and companies.

20.2

Advatek aims to help curb the production of greenhouse gases by ensuring all fleet vehicles purchases consider the impact on the environment. This extends as well any and all heating sources. Vehicles are only permitted to idle when required for operation or operational safety.

20.3

Advatek will ensure that during the course of activities that minimal impact will affect local Habitat. This is accomplished by encouraging clients to re-use existing pre-claimed spaces before developing new locations, as well as awareness of local water ways.

20.4

Advatek will always attempt to reduce materials by recycling what is possible. Where devices are non salvageable those devices will be kept for parts where able. Any device beyond salvage will be sent to local recycling where available.

20.5

Advatek has undertakes a program to ensure energy conservation by reducing overall power consumption in the business. This is also done during out deployment by ensuring that systems operate at the lowest consumption possible when able.

20.6

Advatek promotes water conservation by encouraging the use of re-usable containers for water storage for commercial use or personal consumption. Advatek also requires that water ways be identified on any new project sites for protection if required.