

LADDER SAFETY

Types of Ladders

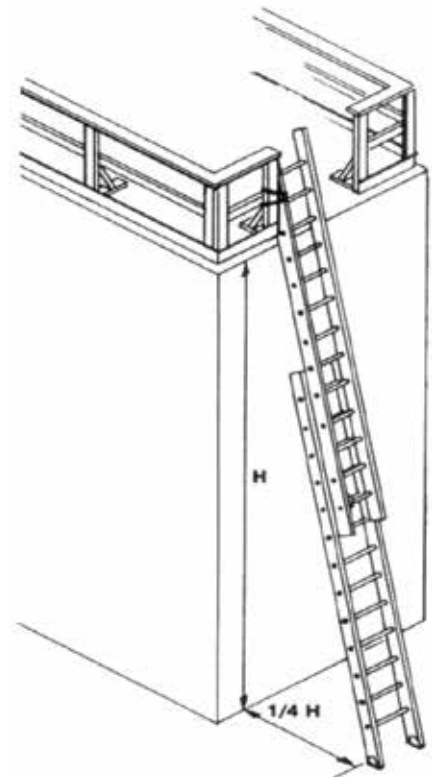
There are many types of ladders and it is important to choose the right ladder for the task. Here are some different types:

- Extension/straight
- Fixed access
- Tripod orchard (orchard use only – never use indoors or for smooth surface application)
- Stepladder

Extension/Straight Ladders

When using a straight or extension ladder, place the ladder on a firm surface. Make sure it has slip resistant feet, use secure blocking or have someone hold the ladder. When using extension ladders raise the extension ladder to the desired height and ensure both sides are locked.

The top of the ladder should extend at least 3 feet above the roof line/contact point. Follow the '4 to 1' rule: one foot back for each four feet up. When you set up the ladder, count the number of rungs up to the point where the ladder touches the wall. The bottom of the ladder must be one rung's length out from the wall for every four rungs up the wall. If needed, secure the top of the ladder. Tie the top of the extension ladder to an anchor point.



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Fixed Access Ladders

Fixed (permanent) platforms with access by stair or ladders are needed when regular access is required to equipment elevated either above or below floor level. When installing a fixed access ladder, ensure design requirements comply with *OHSA*, Regulations for Industrial Establishments, Section 18 and use appropriate safety devices/precautions, for example, a fall arrest harness and a travelling fixture.

Always maintain three-point contact. This is done by having two hands and one foot, or two feet and one hand on a ladder at all times. When climbing the ladder, face the ladder and place your feet firmly on each rung. Ensure your footwear is clean and free of mud, etc. If you need tools, raise or lower using a hand-line or place the tools in a pouch.

Tripod Orchard Ladders

Tripod orchard ladders are designed for use on soft and uneven surfaces; they do not have spreaders. An orchard ladder has a single back leg. This provides relatively stable support on uneven terrain.

This type of ladder is meant to be used in soft soil, therefore the ladder could collapse if used on firm, smooth ground. The steps are at least 27 inches long and should have a metal angle brace. The maximum flare on the top to bottom rails (averaging 2.25 inches per foot) is required to stabilize the base. To avoid excessive penetration in soft soil, a double base on the rails is provided.

An orchard ladder should be used for specific operations, such as pruning and harvesting. The top of the ladder can be made of a combination of wood or metal. Only one person should be on the ladder at a time. When using the ladder, the back of the ladder should be towards the tree center, allowing for additional support if the worker slips. Never use the top of the ladder as a step.



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Stepladders

Many of the rules for straight ladders apply to stepladders as well. Never use a step ladder as a straight ladder. Use a platform type stepladder with side rails – it provides safer support and a more stable working surface. Be sure to lock the stepladder – spread the legs to their limit and ensure the braces are locked.



Ladder Classifications

| Max. Load Capacity | Project Use | Load Rating | CSA |
|--------------------|-----------------------------|-------------|---------|
| 250 lbs | Construction and Industrial | Heavy | Grade 1 |
| 225 lbs | Tradesman and Farm | Medium | Grade 2 |
| 200 lbs | Household | Light | Grade 3 |

Source: CAN/CSA - Z11 - M81 (R2011) Portable Ladders

| Max. Load Capacity | Load Rating | ANSI |
|--------------------|------------------|----------|
| 375 lbs | Special Duty | Type IAA |
| 300 lbs | Extra Heavy Duty | Type IA |
| 250 lbs | Heavy Duty | Type I |
| 225 lbs | Medium Duty | Type II |
| 200 lbs | Light Duty | Type III |

Source: ANSI ASC A14.2-2007 - Ladders - Portable Metal - Safety Requirements

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Material

Ladders are made from a number of different materials, each having its own uses and limitations. The different materials are:

- Aluminum
- Fibreglass
- Wood
- Steel

Aluminum

Aluminum is the most common material in ladders. Ladders made from aluminum are lightweight, moisture and corrosion resistant. Aluminum conducts heat and electricity; therefore, it should not be used where either of these conditions exists such as for electrical work.

Fiberglass

Fiberglass is an engineered or man-made material that consists of strands of high-strength glass fibres that are encapsulated in a resin matrix. Fiberglass is a non-conductor of heat and electricity and is moisture and corrosion resistant. Fiberglass ladders are heavier than aluminum ladders. Fiberglass ladders should be used for all electrical work and where accidental contact with electrical wires may occur.

Wood

Wood is a natural material and was the most popular choice before the introduction of aluminum and fibreglass ladders. Wood ladders are heavier than aluminum or fibreglass ladders, and because it is a natural material, will have some variations in strength, and can also splinter, rot, warp, and absorb moisture. Wooden ladders are non-conductors of heat and electricity when kept clean and dry. Wooden step ladders do not usually come equipped with non-slip feet, and therefore should not be used in workplaces. Wood ladders must not be painted because it may hide critical flaws and cracks.

Steel

Steel ladders can be very heavy, but are designed to meet specific load requirements. They conduct heat and electricity; therefore, should not be used in these conditions. As well, steel is susceptible to rust and corrosion.

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Hazards

Injury statistics show that the use of ladders presents many hazards. Injuries involving ladders frequently cause permanent disability.

The hazards associated with ladders include:

- Falls from ladders
- Struck by falling ladders
- Struck by materials falling from ladders
- Tripping over ladders (erect or lying on floor)
- Lifting heavy ladders
- Striking persons or objects when carrying ladders
- Contact with electrical equipment

Controls

Develop a policy on ladders which covers use, inspection, repair, and disposal. Emphasize compliance with the legal requirements covering ladders. Establish safe practices for the use of ladders. Make sure they are followed. Consider first options that may allow the work to be done without having to use a ladder in the first place: can the work be lowered so it can be done at regular height? Can mirrors, cameras or other devices be used to monitor processes from ground level? Is there a way to get the work done without putting an individual at risk on the ladder?

General Safety Practices

- Use the right ladder for the job
- Inspect the ladder before and after use
- Get help when moving heavy or long ladders
- Ensure that portable ladders of all types are placed on a stable surface
- When climbing make sure your shoes/boots are clear of mud, snow and grease
- Protect base of ladder from accidental contact with traffic (human or vehicle) by securing it with hazard tape or warning signs and or having someone present at the base

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- Secure the top of a ladder when using it to access a platform or scaffold and ensure that the top of the ladder extends above the upper surface (see extension ladders above)
- Face the ladder when ascending or descending – maintain 3 point contact
- Hoist materials or attach them to a belt – do not carry materials in your hands
- Make sure that only one person at a time is on the ladder
- Don't stretch or reach beyond the side rails of a ladder – a shift in the centre of gravity could cause the ladder to slip
- Never stand any higher than on the third rung from the top of a step ladder
- Assess hazards that may arise from the area the work is being done. Identify and where possible keep work away from power lines or other hazards. If you must work near power lines, ensure that they are identified and always use a fiberglass ladder – NEVER work with a metal ladder around power lines

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Inspection Checklist

The following checklist covers many areas of potential problems. It may be used as a maintenance, department or pre-shift check. Modify it to suit your needs.

Ladder No.: _____

Location: _____

Date Purchased: _____

Type of Ladder: _____

Length of Ladder: _____

Material: Wood Metal

| <input checked="" type="checkbox"/> Acceptable <input checked="" type="checkbox"/> Unacceptable | Dates of Inspection | | | | | | | | | |
|---|---------------------|--|--|--|--|--|--|--|--|--|
| Rungs (loose, moveable by hand)? | | | | | | | | | | |
| Nails, screws, bolts or other metal parts (loose)? | | | | | | | | | | |
| Handling procedures | | | | | | | | | | |
| Wooden parts smooth (no splinters, splits, cracks, chips)? | | | | | | | | | | |
| Non-slip safety feet (in proper condition)? | | | | | | | | | | |
| Ladder (stable)? | | | | | | | | | | |
| Hinge spreaders (tight, straight)? | | | | | | | | | | |
| Hinge spreader stops (functioning correctly)? | | | | | | | | | | |
| Hinges (tight)? | | | | | | | | | | |
| Extension locks (in place, in good condition)? | | | | | | | | | | |
| Rope (undamaged)? | | | | | | | | | | |
| Identification marks (legible)? | | | | | | | | | | |
| Ladder (stored properly when not in use) | | | | | | | | | | |
| | | | | | | | | | | |
| Certification: | | | | | | | | | | |
| Initials of person making inspection: | | | | | | | | | | |
| Notes: | | | | | | | | | | |

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Storage and Maintenance

- Store ladders where they are not exposed to weather
- Ladders should be cleaned on a regular basis
- Moving parts should be kept clean and lubricated
- Store ladders horizontally on racks, with support every 2m (6ft)
- Inspect for common defects such as broken rungs, split side rails, worn or broken safety feet, and oil or grease which can make climbing surfaces slippery
- Tag a defective ladder for repair or replacement
- Destroy ladders that cannot be safely repaired
- Prohibit repairs which include tying or binding with wire prohibiting the painting of ladders, as this can hide cracks or other weak points

Training

Your employee training program should include the following:

- Choosing the right ladder for the job
- Assessing the area where the ladder will be used, and the condition of the floor or ground
- How to level
- Inspecting for defects
- Using ladders safely
- Dangers of overreaching
- Awareness of unsafe practices such as:
 - Setting ladder on boxes, steps, etc.
 - Climbing with wet or greasy shoes
 - Removing the safety feet
 - Leaning the ladder against unstable support

Protective equipment such as fall arrest/restraint may be required in some circumstances. Specific Training may be required when working at heights. Contact WSPS for more information.

Use the safe practices in this guideline to supplement your training.

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Legislation

Regulation for the Industrial Establishments (Reg. 851) made under the *Occupation Health and Safety Act*

- Section 18: Access Ladder requirements
- Section 19: Requirements that permanent platforms shall be provided when frequent access is required
- Section 73: Portable Ladder requirements

In some cases the Construction Regulations may also apply. Consider carefully the work being conducted. If it considered to be construction work, work must be performed in accordance to those regulations, even if the work is performed in a non-construction setting.

Standards, Guidelines, and References

- CAN/CSA – Z11 – M81 (R2005) Portable Ladders
- ANSI ASC A14.2-2007 Ladders – Portable Metal
 - Safety Requirements
- Canadian Centre for Occupational Health and Safety (CCOHS)
- Ontario Ministry of Labour (MOL) Engineering
- Ohio State University Extension, Orchard Ladder Safety

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