Portable Ladder Safety

This course will help you learn how to work safely when using portable ladders and avoid falling and getting injured. It is designed to promote safe work practices based on requirements of the Portable and Fixed Ladder Standard - WAC 296-876.

Topics Covered

1. Introduction
2. Reasons for falls from ladders
3. Ladder use training requirements
4. Ratings and labels on ladders
5. Composition of ladders
6. Safe ladder practices

NOTE: Job-made ladders are not addressed in this course; only commercially manufactured ladders are covered, as they are widely available and used.
Introduction

Ladders are important and essential tools that are used widely in a variety of industries. They help us move up and down and work at different heights.

Portable ladders, in particular, are useful tools because they can be readily moved or carried. They are simply built and come in many sizes, shapes and styles.

Introduction (Con't.)

Although ladders are easy to use, they are often misused or abused, causing serious injuries and deaths. These deaths and injuries could have been significantly reduced or eliminated with proper care and use.

Introduction (Con't.)

Injuries From Ladder Falls

from L & I worker compensation claims
OSHA Training, Diocese of Davenport

Introduction (Continued)

You don't have to fall far to get hurt. Workers injured in falls from ladders are usually less than 10 feet above the ladder's base of support.

Recently, a worker fell while descending a ladder used to access a 30" counter and fractured his ankle. He died a week later from a blood clot caused by the fracture.

Ladder fatality report

Reasons for falls from ladders

Why do people fall from ladders if they are so easy to use?

• Setting up the ladder on an unstable or slippery base surface is a primary reason ladders fall over.
• Overreaching by the user.
• Setting up the ladder improperly.
• Loss of balance.

Reasons for Falls (continued)

• Improperly getting onto or off of the ladder.
• Mis-stepping or a slipping of the foot while climbing or descending.
• Being bumped by a cart or other object.
• Having a vehicle run into or bump you.
• People not paying attention to where they're walking.

Online Video – "Don't Fall For It" – describes actual ladder falls by workers – 13 minutes.

Whose coming through the door?
Ladder Safety Training

• Employers have a responsibility to make sure that each employee who uses a ladder understands how to use the ladder correctly on the job.
• They must provide training to employees in recognizing hazards related to ladders and in the procedures they must follow to minimize these hazards.
• Employees have a responsibility to observe the rules and follow the procedures established by their companies’ programs, and to work safely when using ladders.

A competent person must conduct the training.

A competent person is an individual who:
• Is knowledgeable of ladders, including the manufacturers’ recommendations and instructions for proper use, inspection, and maintenance.
• Can identify existing and potential or predictable hazards in the work environment, and evaluate the risk of falls.
• Has the authority to take prompt corrective measures to eliminate those hazards.
• Is knowledgeable of the rules contained in the safety standards regarding the use, inspection, and maintenance of ladders.

The training must cover the following areas:

✓ The nature of the ladder hazards at the worksite.
✓ Proper construction, use, placement, and care in handling ladders.
✓ Maximum intended load-carrying capacities of ladders used.
✓ Safety standards for the types of ladders that will be used.
To prevent injuries while using portable ladders, you need to know what kinds of ladders there are and how to use them properly. There are various types, shapes, and sizes of ladders to help you accomplish your tasks.

### Types of Ladders

<table>
<thead>
<tr>
<th>Ladder Type</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step Ladder</td>
<td>Special duty industrial use, such as CATV, utilities, contractors, and higher capacity needs</td>
</tr>
<tr>
<td>Extension Ladder</td>
<td>Extra-heavy-duty industrial use, such as utilities and contractors</td>
</tr>
<tr>
<td>Platform Ladder</td>
<td>Heavy-duty industrial use, such as utilities and contractors</td>
</tr>
<tr>
<td>Orchard Ladder</td>
<td>Medium-duty work, such as painting, offices for building maintenance, and light industrial use</td>
</tr>
<tr>
<td>Combination Ladder</td>
<td>Light-duty work, such as household use</td>
</tr>
</tbody>
</table>

Further descriptions of different types of ladders are covered in Ladder Safety - Module 2.

### Ladder Ratings and Labels

Although there are many different kinds of portable ladders, they all receive a rating based on their maximum intended or working load - the total weight that they can safely support. This includes the weight of the worker, tools, and materials.

<table>
<thead>
<tr>
<th>Rating</th>
<th>Maximum Load</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I-AA</td>
<td>375 lbs</td>
<td>Special duty industrial use, such as CATV, utilities, contractors, and higher capacity needs</td>
</tr>
<tr>
<td>Type I-A</td>
<td>300 lbs</td>
<td>Extra-heavy-duty industrial use, such as utilities and contractors</td>
</tr>
<tr>
<td>Type I</td>
<td>250 lbs</td>
<td>Heavy-duty industrial use, such as utilities and contractors</td>
</tr>
<tr>
<td>Type II</td>
<td>225 lbs</td>
<td>Medium-duty work, such as painting, offices for building maintenance, and light industrial use</td>
</tr>
<tr>
<td>Type III</td>
<td>200 lbs</td>
<td>Light-duty work, such as household use</td>
</tr>
</tbody>
</table>

These ratings must meet certain American National Standards Institute (ANSI) standards and they must be indicated on the duty rating sticker or manufacturer’s label. ANSI requires that every ladder be labeled with this information so users can determine if they have the correct type of ladder for the task/job.
Ratings and Labels (Continued)
Besides their ratings, labels and markings found on manufactured ladders contain product information, such as:
- Manufacturer’s name
- Ladder’s model number/name
- Month and year of manufacture
- Ladder’s size/length, maximum working length,
- Highest standing level

Manufactured ladders have warning markings and labels, such as "CAUTION" and "DANGER," which are usually in red or yellow. They often also have "SAFETY" labels which give information on how to use the ladders safely.

Ratings and Labels (continued)
Before you use a ladder, check its rating to see if you have the right ladder for the job. Be sure not to subject the ladder to a work load greater than its rated capacity. And, always read manufacturers’ labels and follow their recommendations. Do yourself a favor and avoid a fall and injury to yourself.
Ladder Composition

Besides having different ratings or load capacities, ladders may be constructed of various kinds of materials – usually wood, fiberglass or metal. Each material has specific care, maintenance, and storage requirements and may be preferred for specific uses, or under certain conditions.

---

General Characteristics

(These may vary, depending on the specific kind of wood or metal that the ladder is constructed of)

<table>
<thead>
<tr>
<th>Property</th>
<th>Stability</th>
<th>Durability</th>
<th>Strength-to-weight ratio</th>
<th>Weather-resistance</th>
<th>Conductivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>WOOD</td>
<td>Better</td>
<td>Less</td>
<td>Good</td>
<td>Not as good</td>
<td>Non-conductive when clean and dry</td>
</tr>
<tr>
<td>FIBERGLASS</td>
<td>Less (lighter)</td>
<td>Better</td>
<td>High</td>
<td>Better</td>
<td>Non-conductive when clean and dry (preferred)</td>
</tr>
<tr>
<td>ALUMINUM/STEEL</td>
<td>Less (lighter)</td>
<td>Better</td>
<td>High</td>
<td>Better</td>
<td>Conductive – do not use near exposed electrical sources</td>
</tr>
</tbody>
</table>

Ladder Composition (continued)

When selecting a ladder, you should consider the different properties: weight, durability, and other characteristics, like conductivity. Conductivity is important if you are working around power lines or other electrical or energized sources.

---

Dangerous practice!! Avoid using metal ladders around power lines
Ladder Composition (continued)

Do not use a metal ladder when working around energy sources. Metal ladders must be labeled with a DANGER warning sticker stating:

- “Electrocution Hazard”
- “This Ladder Conducts Electricity”
- “Do Not Use Around Electrical Equipment”
- Or other equivalent wording

Ladder Composition (continued)

Wood, metal, and fiberglass ladders may also have some specific construction requirements.

For example, metal and fiberglass ladders must have:

- Slip or skid-resistant feet
- Steps or rungs that are corrugated, knurled, dimpled, coated with skid-resistant material, or treated to minimize possible slipping

Inspect ladders before use

Look for cracks, splits, dents, bends, corrosion, and missing hardware.

All of these ladders are unsafe and could fail if used by employees.
Mud, Oil or Grease

Keep shoes/boots free of slippery substances.

Inspect ladder rungs for any oil, grease, mud or other slippery substances which could affect traction.

Climbing or descending a ladder

When climbing a ladder, you must have both hands free and face the ladder. This allows for three points of contact with the ladder at all times and reduces the chances of falling. The three point contact is two hands and one foot or one hand and two feet.

This way

Not this way

Step Ladder Misuse

Rather than a firm, level surface, this stepladder is positioned on a fence so the such that the bottom step is taking the load rather than the side rails. It doesn't extend three feet above the roof surface, is not secured, and the worker is standing on the top step to access roof.

This stepladder is being misused to access doorway.

Stepladders can't be used partially closed and leaned against the wall.
Step-Ladder Safety Tips

Open up step ladder legs completely and lock the spreader bar braces.

Don’t stand on the top step or top cap.

Don’t use it as a straight ladder to climb up to a higher surface.

Never use the top of a step ladder

Warning labels on stepladders clearly state that the top step and top cap are not to be used as a step. The higher you are on a step ladder, the less stable it becomes.

Setting up an extension ladder

When working from an extension ladder, make sure it is set up at a 4:1 angle with secure footing on a firm level surface.

For accessing an upper level, make sure the extension ladder is set up at a 4:1 angle on a firm, level surface and the side rails extend at least 3' above the surface to be accessed.

Lastly, make sure the extension ladder is secured at the top and bottom.

Proper ladder set-up

Improper ladder set-up (not 3 ft. above roof line)
Proper Extension Ladder Setup

For every four feet of ladder length measured from where the ladder contacts the support point, the base of the ladder should be one foot away from the supporting structure (one to four rule).

The ladder must extend at least three feet above the surface to provide safe access or be rigidly secured at the top with a grasping device if less than three feet.

The ladder in the photo contacts the supporting structure at 9 feet. This means that the base of the ladder should be 27 inches back from the support.

Determining proper ladder setup angle

One way to ensure proper angle is to stand with your feet at the base of the ladder and extend your arms straight out. If your hands just touch, the ladder will be very close to the 4 to 1 ratio.

Climbing and descending

This worker does not have both hands free to hold onto the ladder while climbing or descending the ladder.

Proper ladder climbing with tools on belt and both hands free.
More Information

L & I - Ladder Safety Webpage
OSHA – Construction Ladder Misuse
OSHA – QuickCard Portable Ladder Safety Tips
Ladder Safety.org – summary of types of ladders
WorksafeBC – Safe Ladder Use – 13 minute online video
Ladder Safety Checklist

Note: for review, 4 quiz questions with answers follow this slide

---

Portable Ladder Safety

Training - Question 1

You have to fall more than 15 feet from a ladder before you get hurt.

- True
- False

---

Portable Ladder Safety

Training - Question 1 - ANSWER

You have to fall more than 15 feet from a ladder before you get hurt.

- True
- False

False – Workers injured in falls from ladders are usually less than 10 feet above the ladder’s base of support.
### Portable Ladder Safety

#### Training - Question 2

Injuries from ladders can occur from:
- Reaching too far out away from the ladder
- Misstep or slip of the foot while climbing
- Setting up the ladder on an unstable or slippery surface
- All of the above

#### Portable Ladder Safety

#### Training - Question 2 ANSWER

Injuries for ladders can occur from:
- Reaching too far out away from the ladder
- Misstep or slip of the foot while climbing
- Setting up the ladder on an unstable or slippery surface
- All of the above

All of the above reasons may result in injuries from falls from ladders.

#### Portable Ladder Safety

#### Composition – Question 3

A ladder is rated according to:
- Its size
- How it is to be used
- The total weight that it can safely support
- The kind of material it is made of
**Portable Ladder Safety**

Composition – Question 3 - ANSWER

A ladder is rated according to:

- It's size
- How it is to be used
- The total weight that it can safely support
- The kind of material it is made of

---

**Portable Ladder Safety**

Composition – Question 4

A Type I ladder refers to:

- A ladder made of fiberglass
- A ladder rated for heavy industrial use, 250 lbs.
- A ladder rated for household use, 200 lbs.
- A ladder made of wood

---

**Portable Ladder Safety**

Composition – Question 4 - ANSWER

A Type I ladder refers to:

- A ladder made of fiberglass
- A ladder rated for heavy industrial use, 250 lbs.
- A ladder rated for household use, 200 lbs.
- A ladder made of wood