

Portable Ladder Safety

Oregon OSHA Online Course 1330

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INTRODUCTION

Why is this class important?

Follow the numbers...

In Oregon, falls from ladders resulted in over 400 serious injuries and deaths in 2008 (the most current data available). The financial burden placed on businesses by those claims was an average of approximately \$31,000 each.

From 2004 – 2008 the numbers for worker compensation claims look like this:

2004	2005	2006	2007	2008
437	403	422	463	404

Also from 2008 statistics, the second most commonly cited item by Oregon OSHA was for the inappropriate use of portable ladders. 144 citations resulted in a total of over \$32,000 in penalties being assessed.

We take portable ladders for granted because they are so easy to use and we have been climbing ladders since we could walk. Yet more workers are injured in falls from ladders than from any other elevated surface — roofs, scaffolds, balconies, even stairs. Why do workers fall from ladders? Most falls happen because workers select the wrong type of ladder for their job, they use a damaged ladder or they set up the ladder improperly and the ladder shifts or slips unexpectedly.

MODULE 1: SELECTION OF LADDERS

Types of Portable Ladders

Let us talk about the first cause of falls from ladders: “workers select the wrong type of ladder for their job”

How many types of ladders can you think of?



Have you ever had this happen? You are at home and a light bulb burns out. You go to the garage to get the ladder. What choices do you have...not including the kitchen chairs? In my house, we have a step stool that is maybe 12 inches tall, a 5-foot stepladder, and a 24-foot extension ladder. If my ceiling height is 8 feet tall, what should I choose?



How do you choose the right tool for the job?

Don't get confused. There are really only three types of ladders to choose from. We will focus on these three types in this class; straight ladders, extension ladders, and stepladders.

Why is it important to select the right type of ladder? Don't they all work?

One of the most common mistakes Oregon OSHA sees during inspections is a stepladder used as a straight ladder.



Look at the feet of the ladder.

They are designed to sit flat on a solid surface, otherwise the ladder can slip.

What are my choices when choosing a ladder?



1. Step Ladder



2. Straight Ladder

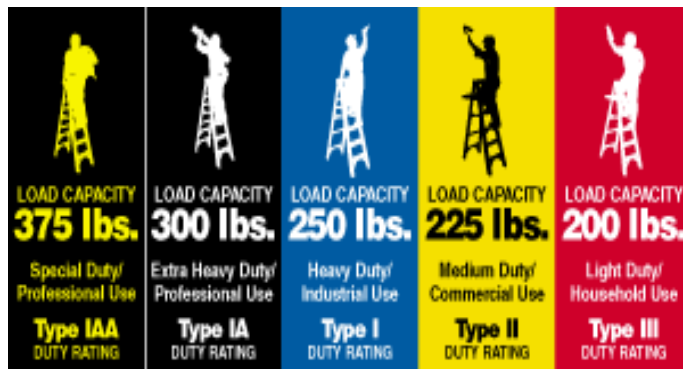


3. Extension Ladder



4. Job Made Ladder

What is the intended purpose of each type? What is it made from?



What is this?

Manufacturers give ladders duty ratings; this is based on the maximum weight they can safely support.

How do you determine the necessary rating?

$$\text{Maximum employee weight} + \text{Tools/Equipment/Supplies} = \text{Maximum intended load}$$

Before you purchase a ladder, consider the maximum weight it will support. Don't subject it to a load greater than its duty rating.

Since you have decided what type of ladder, you need for the job and how much weight it will need to support by checking the duty rating. Look around at the surface the ladder will be placed on. Is it slippery or soft?

How do you determine what is the appropriate ladder base?

Determine the appropriate base by looking at the feet of the ladder:



Look around your environment. Are there other things that could affect the integrity of your ladder?

Electrical?



Chemicals?





Heat?

A quick word about fiberglass ladders:

Fiberglass ladders must also be handled and maintained with more care than wood ladders. After a few years, the reinforcing fibers in fiberglass rails may become exposed, resulting in a condition known as “fiber bloom.” High humidity and exposure to strong sunlight can accelerate the condition. Fiber bloom does not affect a ladder’s strength but it will affect the appearance and may cause users mild discomfort if exposed fibers penetrate their skin. Another more significant concern with fiber bloom is that the fibers can now pick up moisture and create a potentially conductive ladder.

Regular washing and waxing with a commercial non-slip paste wax will protect the ladder and reduce the potential for fiber bloom. Periodically coating the ladder with acrylic lacquer or polyurethane also will protect it.

So back to our story...which ladder should I choose to change my light bulb?

12-inch stool, 5-foot stepladder, or 24-foot extension ladder?



MODULE 2: INSPECTING YOUR LADDER

Neglected ladders can quickly become unsafe ladders. Step bolts loosen, sockets and other joints work loose, and eventually the ladder becomes unstable. Ladders are expensive tools and periodic maintenance extends a ladder's life and will save replacement costs. Maintenance includes regular inspection and repairing damage.



See OSHA's rules for Ladder inspections for:


- All workplaces (general workplace inspections)
- Construction workplaces
- General industry workplaces
- Agricultural workplaces


Even though Oregon OSHA does not require you to keep a record of your ladder inspections, it is much easier to prove you did it if you have the paperwork. The saying "The job's not finished until the paperwork is done" holds true here. The benefit is you can also see if there are trends developing, like defective parts.


			
CLIMBING PRO™		Ladder Inspection Form	
<small>SAFETY TRAINING</small>		<small>Provided by Werner Co.</small>	
Company Name: _____ <small>Please Print</small>			
Ladder Reference Number: _____		Dept. _____	
Inspector _____		Date _____	
<input type="checkbox"/> Stepladder	Size _____ ft.		
<input type="checkbox"/> Fiberglass	<input type="checkbox"/> Aluminum	<input type="checkbox"/> Wood	
	Steps: Loose, Cracked, Bent or Missing	<input type="checkbox"/>	<input type="checkbox"/>
	Rails: Cracked, Bent, Split or Frayed	<input type="checkbox"/>	<input type="checkbox"/>
	Rail Shields	<input type="checkbox"/>	<input type="checkbox"/>
	Labels: Missing or Not Readable	<input type="checkbox"/>	<input type="checkbox"/>
	Pail Shelf: Loose, Bent, Missing or Broken	<input type="checkbox"/>	<input type="checkbox"/>

Manufacturer's Inspection Sheet

Here is an example of a manufacturer's inspection sheet:

		<h3>Ladder Inspection Form</h3> <p>Provided by Werner Co.</p>	
Company Name: _____			
Please Print			
Ladder Reference Number: _____		Dept. _____	
Inspector _____		Date _____	

<input type="checkbox"/> Stepladder	Size _____ ft.				
<input type="checkbox"/> Fiberglass <input type="checkbox"/> Aluminum <input type="checkbox"/> Wood				Yes	No
 <p style="font-size: x-small;">Circle Areas of Damage</p>	Steps:	Loose, Cracked, Bent or Missing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Rails:	Cracked, Bent, Split or Frayed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Rail Shields	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Labels:	Missing or Not Readable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Pail Shelf:	Loose, Bent, Missing or Broken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Top:	Cracked, Loose or Missing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Spreader:	Loose, Bent or Broken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	General:	Rust, Corrosion or Loose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other:	Bracing, Shoes, Rivets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Actions:		<input type="checkbox"/> Ladder tagged as damaged & removed from use			
		<input type="checkbox"/> Ladder is in good condition			

<input type="checkbox"/> Extension Ladder	Size _____ ft.				
<input type="checkbox"/> Fiberglass <input type="checkbox"/> Aluminum				Yes	No
 <p style="font-size: x-small;">Circle Areas of Damage</p>	Rungs:	Loose, Cracked, Bent or Missing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Rails:	Cracked, Bent, Split or Frayed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Labels:	Missing or Not Readable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Rung Locks:	Loose, Bent, Missing or Broken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Hardware:	Missing, Loose or Broken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Shoes:	Worn, Broken or Missing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Rope/Pulley:	Loose, Bent or Broken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other:	Bracing Rivets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	General:	Rust, Corrosion or Loose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Actions:		<input type="checkbox"/> Ladder tagged as damaged & removed from use			
		<input type="checkbox"/> Ladder is in good condition			

If any defect or damage is found during the inspection, you **must** do the following:

Tag the ladder with the following statement: "Dangerous, DO NOT USE!"

AND: Repair the ladder immediately to original condition

OR: Destroy the ladder...not merely put it in the trash for someone to retrieve

MODULE 3: SETTING UP YOUR LADDER

We have addressed the first two likely causes of falls from ladders. Let's talk about the last one and then we will discuss how you can ensure that your employees are protected.

Ladder Setup

A typical ladder setup will take five steps:

1. Look around where the ladder should be located
2. Move the ladder to that location
3. Raising the ladder
4. Securing the ladder
5. Testing the ladder

Look around the area that the ladder will be set up in. What do you see?



Once you have looked around the area you want to set your ladder up in you must make sure that there is enough room to do that safely. Some things to consider when setting it up are:

- Protect the base of the ladder so it can't be bumped, think about doors or walkways
- Ensure you can extend it to 3 feet above where you want to step off the ladder
- Ensure you can have a 4:1 ratio for angle of the ladder or enough room to lock open a stepladder

Achieving a 4:1 set-up angle

A non-self-supporting ladder should have a set-up angle of about 75 degrees — a 4:1 ratio of the ladder's working length to set-back distance.

Here's how to achieve it: Stand at the base of the ladder with your toes touching the rails. Extend your arms straight out in front of you. If the tips of your fingers just touch the rung nearest your shoulder level, the angle of your ladder has a 4:1 ratio.



Now that the area is clear of hazards, protect yourself while moving the ladder. Remember the proper body mechanics when lifting.



Once the ladder has been safely moved into position and raised. We need to ensure that the ladder is stable and cannot be knocked over. This is done in a variety of ways:

- One way is to tie the ladder off to the structure
- Another way is to ensure that the base is solid and level



If you are using the ladder to access another surface, like a second floor on a construction site, or the roof of a building, then you must extend the ladder 3 feet above the landing or provide secure handhold to grab onto.



This allows employees to have a secure area to step off to, and will keep the ladder from slipping, potentially causing a fall.

The ladder is set and stable; it's ready to climb right? Not so fast...check the rungs of the ladder. When setting up a ladder there may be debris that settles on the rungs of the ladder. Make sure that before you step onto the ladder the rungs are clear of mud, ice or other debris that could make them slippery.

MODULE 4: USING THE LADDER

In order to avoid a costly accident employees must know how to work from a ladder. Most of you are already thinking that you do know how to work from a ladder. Maybe you do. You can take that knowledge and pass it along to those who don't understand. If you don't know how to work from a ladder then you can learn something new so that you don't end up as a statistic, like these...

February 2010

The 38 year-old employee was using a ladder that was placed against an eight foot tall mold. The employee stepped on a rung and as he swung his leg around to place his other foot on the rung, the **ladder slipped** and he fell to the ground. The employee sustained four fractured vertebrae and a serious laceration on his head.

January 2010

The 47 year-old employee was on a 10 foot stepladder fixing a light when he **fell** from the sixth rung landing on pavement. He suffered a concussion, a fractured left wrist, and a cut above his left eye.

November 2009

The 58 year-old employee was descending a ladder and **fell** between two unprotected rafters and through a ½ inch thick sheetrock ceiling. The employee fell 13 feet to a lower level and sustained broken facial bones and a laceration to the right knee.

June 2009

The 63 year-old employee was descending a fixed ladder on an RV when he **missed the last step** and fell approximately four feet to the ground. He struck the back of his head and was rendered unconscious. The employee sustained a cracked skull and a brain contusion, and was hospitalized for three days.

Unfortunately, there is no shortage of these stories. This is a very small sample of the injuries that Oregon OSHA hears about. There are many more that we may not hear about.

How to work safely on your ladder:

- Wear shoes that have non-slip soles; make sure they are free of mud, oil, or anything else slippery.
- Climb facing the ladder. Center your body between the rails and keep your hips square to the rungs. Hold the side rails with both hands; you have a better chance of avoiding a fall if a rung or step fails.
- Hold the ladder with one hand and work with the other hand whenever possible.
- Attach light, compact tools or materials to the ladder or to yourself.
- Raise and lower heavy, awkward loads with a hand line or a hoist.
- Use extreme caution when you're pushing or pulling materials while on the ladder.



MODULE 5: MAINTENANCE AND STORAGE OF YOUR LADDER

Neglected ladders quickly become unsafe ladders. Step bolts loosen, sockets and other joints work loose, and eventually the ladder becomes unstable. Periodic maintenance extends a ladder's life and saves replacement costs. Maintenance includes regular inspection, repairing damage, and tightening step bolts and other fastenings.

Inspecting Your Ladder

- Inspect your ladder each time you use it. (A competent person must periodically inspect ladders for defects and after any occurrence that could make them unsafe.)
- Replace lower steps on wooden ladders when one-fourth of the step surface is worn away. Typically, the center of a step receives the most wear. Mineral abrasive or other skid-resistant material reduces wear.
- Don't paint wood ladders; paint conceals defects.
- Clean and lightly lubricate moving parts such as spreader bars, hinges, locks, and pulleys.
- Inspect and replace damaged or worn components and labels according to the manufacturer's instructions.
- Inspect the rails of fiberglass ladders for weathering, fiber bloom, and cracks.
- Keep the ladder away from heat sources and corrosive materials.

How to Store Your Ladder

Ladders are expensive tools. You'll extend a ladder's life by storing it properly:

- Use a well-ventilated storage area.
- Store wood and fiberglass away from excessive moisture, heat, and sunlight.
- Keep them away from stoves, steam pipes, or radiators.
- Store non-self-supporting ladders in flat racks or on wall brackets that will prevent them from sagging. Store stepladders vertically, in a closed position, to reduce the risk of sagging or twisting.
- Secure them so that they won't tip over if they are struck.
- Keep material off ladders while they are stored.

MODULE 6: TRAINING REQUIREMENTS

Why is it important to know how to use a tool such as a ladder?

What do the rules say about training?

1926.1060 Training Requirements

The following training provisions clarify the requirements of §1926.21(b)(2), regarding the hazards addressed in Subdivision X.

(a) The employer shall provide a training program for each employee using ladders and stairways, as necessary. The program shall enable each employee to recognize hazards related to ladders and stairways, and shall train each employee in the procedures to be followed to minimize these hazards.

(1) The employer shall ensure that each employee has been trained by a competent person in the following areas, as applicable:

- (i) The nature of fall hazards in the work area;
- (ii) The correct procedures for erecting, maintaining, and disassembling the fall protection systems to be used;
- (iii) The proper construction, use, placement, and care in handling of all stairways and ladders;
- (iv) The maximum intended load-carrying capacities of ladders used; and
- (v) The standards contained in this subdivision.

(b) Retraining shall be provided for each employee as necessary so that the employee maintains the understanding and knowledge acquired through compliance with this section.

OAR 437-004-0350(3)

Training

(a) Prior to assigning an employee to work with orchard ladders, the employer must assure that they have the necessary skills and knowledge to use the ladder safely, or;

(b) The employer must train new employees about the requirements of this standard

Employees who use ladders must receive training by a competent person in proper use, placement, and handling.

Employees need to know the hazards associated with ladder use and know that they are required to follow procedures that minimize the hazards.

Retraining is provided periodically to ensure that employees maintain their knowledge of proper ladder use, placement, and handling. What is periodically?

How should you do the training? We would offer these suggestions:

- Don't only use a video
- Show them
 - Use the 5 step process of on the job training that Oregon OSHA recommends
- Verify
 - Assess the learning – do a test, watch them
- Document the training

Oregon OSHA has many different tools available to help you train and supervise your employees. The ladder page of the A-Z topic list has the latest listing of publications, rules, and interpretations.

Last Words

Employers have the responsibility to keep their employees safe. Employers must spend the time selecting the right tools, teaching their employees what is expected of them, supervising them and correcting any mistakes, and they must lead by example. The reasons are clear.

If you have specific questions about portable ladders or any other safety and health topics at your business contact Oregon OSHA's consultative group for free, personal and confidential service.

www.orosha.org/consultation.html