Ladder Selection and Use

Ladder Selection

An employee who weighs 250 lbs is carrying a 50 lb package. He climbs onto a Type III step ladder. Halfway up the step ladder, it collapses. The employee falls to the ground and breaks his arm. Falls from portable ladders (step, straight, combination and extension) are one of the leading causes of occupational fatalities and injuries. Workers risk falling if portable ladders are not properly selected and safely positioned each time they are used. Too often, accidents and injuries are the result of improper ladder selection and use. Be sure to choose the right style of ladder for the job. Different styles of ladders are designed to keep you safe and productive when climbing or standing. Using the wrong style of ladder or simply ignoring the limitations of climbing equipment can result in a fall or serious injury. Workers should be advised to consider the weight which will be on the ladder and the work application in order to select the proper grade of ladder.

Duty Rating

Duty rating of the ladder - This is an indication of the maximum weight capacity the ladder can safely carry. To figure out the total amount of weight your ladder will be supporting, add:

- The Weight of Your Clothing and Protective Equipment...plus
- The weight of tools and supplies you are carrying...plus
- The weight of tools and supplies stored on the ladder

The Duty Rating of your ladder can be found on the specifications label. Safety standards require a Duty Rating sticker to be placed on the side of every ladder. Do not assume that a longer ladder has a higher weight capacity. There is no relationship between ladder length and weight capacity.

- Type IAA (Extra Heavy Duty) 375 pounds
- Type IA (Extra Heavy Duty) 300 pounds
- Type I (Heavy Duty) 250 pounds
- Type II (Medium Duty) 225 pounds
- Type III (Light Duty) 200 pounds

 Loads

Self-supporting (foldout) and non-self-supporting (leaning) portable ladders must be able to support at least four times the maximum intended load, except extra-heavy-duty metal or plastic ladders, which must be able to sustain 3.3 times the maximum intended load.

Ladder Length

A good rule of thumb is that extension ladders should be 7 to 10 feet longer than the highest support or contact point. The contact point may be the wall or roof line. This additional ladder length allows for proper setup, overlap of ladder sections, height restrictions of the highest standing level, and where appropriate, the extension of the ladder above the roof line.
Ladder Type

The final step in selecting the right ladder is the choice of the proper material. Manufacturers typically offer ladders made from fiberglass and aluminum. Each type of ladder material has characteristics which make it best for a certain application, or one material may simply fit the personal preferences of the user. For example, fiberglass ladders are more appropriate than aluminum ladders for use around electrical wires or in some chemical rich environments. The advantage of an aluminum ladder is usually cost and it is lightweight.

<table>
<thead>
<tr>
<th>Extension Ladder</th>
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<tr>
<td>Ladder Height</td>
<td>Maximum Reach</td>
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<td>16’</td>
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<td>40’</td>
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Ladder Use

Standing Levels and Reaching Heights

The highest standing level is four rungs down from the top. The highest permitted standing level on a stepladder is two steps down from the top. A person standing higher may lose their balance and fall. A person’s maximum safe reaching height is approximately 4’ higher than the height of the ladder. For example, a typical person can safely reach an 8’ ceiling on a 4’ ladder.

Angle

Non-self-supporting ladders, which must lean against a wall or other support, are to be positioned at such an angle that the horizontal distance from the top support to the foot of the ladder is about 1/4 the working length of the ladder. In the case of job-made wooden ladders, that angle should equal about 1/8 the working length. This minimizes the strain of the load on ladder joints that may not be as strong as on commercially manufactured ladders.

Rungs

Ladder rungs, cleats, or steps must be parallel, level, and uniformly spaced when the ladder is in position for use. Rungs must be spaced between 10 and 14 inches apart.

For extension trestle ladders, the spacing must be 8-18 inches for the base, and 6-12 inches on the extension section.

Rungs must be so shaped that an employee’s foot cannot slide off, and must be skid-resistant.

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**Slipping**

Ladders are to be kept free of oil, grease, wet paint, and other slipping hazards.

Wood ladders must not be coated with any opaque covering, except identification or warning labels on one face only of a side rail.

Ladder users risk falling if portable ladders are not safely positioned each time they are used. While you are on a ladder:

- it may move and slip from its supports
- you can also lose your balance while getting on or off an unsteady ladder

Falls from ladders can cause injuries ranging from sprains to death.

**Resources:**

OSHA Publication – Stairways and Ladders, A Guide to OSHA Rules -

- Read and follow all labels/markings on the ladder.
- Avoid electrical hazards! – Look for overhead power lines before handling a ladder. Avoid using a metal ladder near power lines or exposed energized electrical equipment.
- Always inspect the ladder prior to using it. If the ladder is damaged, it must be removed from service and tagged until repaired or discarded.
- Do not use a self-supporting ladder (e.g., step ladder) as a single ladder or in a partially closed position.
- Always maintain a 3-point (two hands and a foot, or two feet and a hand) contact on the ladder when climbing. Keep your body near the middle of the step and always face the ladder while climbing (see diagram).
- Only use ladders and appropriate accessories (ladder levelers, jacks or hooks) for their designed purposes.
- Ladders must be free of any slippery material on the rungs, steps or feet.
- Do not use the top step/runge of a ladder as a step/runge unless it was designed for that purpose.
- Use a ladder only on a stable and level surface, unless it has been secured (top or bottom) to prevent displacement.
- Do not place a ladder on boxes, barrels or other unstable bases to obtain additional height.
- Do not move or shift a ladder while a person or equipment is on the ladder.
- An extension or straight ladder used to access an elevated surface must extend at least 3 feet above the point of support (see diagram). Do not stand on the three top rungs of a straight, single or extension ladder.
- The proper angle for setting up a ladder is to place its base a quarter of the working length of the ladder from the wall or other vertical surface (see diagram).
- A ladder placed in any location where it can be displaced by other work activities must be secured to prevent displacement or a barricade must be erected to keep traffic away from the ladder.
- Be sure that all locks on an extension ladder are properly engaged.
- Do not exceed the maximum load rating of a ladder. Be aware of the ladder’s load rating and of the weight it is supporting, including the weight of any tools or equipment.