Workplace Safety
ACADEMY



ID 9586162 © Michael Rosenwirth | Dreamstime.com

Why Ladder Safety Matters

Safe climbing requires ongoing vigilance. Here are five things to pay attention to before, during and after using a ladder.

by Mike VanBree

Discussions about ladder safety can feel like a case of déjà vu—creating the potential for disaster.

Ladders are familiar, widely available and used so frequently that they are rarely treated as the serious access equipment they truly are. Many workers believe that if they can see a ladder and climb it, no further discussion is needed. Safety professionals know otherwise.

Ladders themselves are not inherently dangerous. Rather, misuse, poor setup and lack of awareness create the risk. Effective ladder safety begins long before workers step onto the first rung and continues through the selection process, initial safety inspection, proper setup, safe usage, and finally transport and storage.

Each stage builds on the last, and skipping any one of them can undermine all the others.

March is Ladder Safety Month, an annual campaign spearheaded

Key Highlights

- When you take one step forward on a ladder, don't take two steps backward—or worse. Ladder falls can occur in a fraction of a second. Following the proper procedures for safe ladder usage is well worth the time it takes to avoid the consequences.
- Falls from height due to improper ladder usage may be perceived as unlikely or not severe because of their frequent usage, but their common usage does not lower their risk assessment. If anything, the frequent use of ladders can cause workers to tune out the potential dangers or harm, which is why it's so important to emphasize safe practices.

Workplace Safety ACADEMY

Why Ladder Safety Matters

by the American Ladder Institute to promote ladder safety at home and at work. It's a timely reminder to refresh and review your training materials, inspect your equipment and remind your workers about the need for constant vigilance when working at height. Ladder safety must be practiced every day, and it requires complete buy-in to reduce the risk of falls.

Selection

Choosing the right ladder begins with an assessment of the environment where work will be done. Before choosing a ladder style or size, it is essential to understand what surface the ladder will be placed on, the elevation to be reached, and how the ladder will be used to access the work area.

If the goal is to access an upper elevation or transition to another surface, a leaning ladder is often preferred because self-supporting ladders are not designed to handle significant side loading. Leaning the ladder into a structure allows workers to transfer as intended, particularly when the ladder is extended approximately 3 feet above the upper contact and it is secured by tying it off or havingsomeone else hold it at ground level during use.

The firmness and levelness of the ground play a major role in ladder selection. On uneven or sloped surfaces, a leaning ladder equipped with ladder levelers may be the best choice rather than attempting to stabilize a self-supporting ladder. You should never attempt to level a self-supporting stepladder or an extension ladder with blocks or other unstable materials.

Different ladder types serve different purposes. Choosing the correct one is a fundamental safety decision. **Self-supporting stepladders** are appropriate when the work can be performed generally in front of the user and the ladder can be placed on a firm, level surface and supported on all four feet. **Leaning ladders**, including **extension ladders**, **single ladders**, and **articulated extendable ladders**, can be better suited for accessing work at higher levels, or transferring to roofs and other elevated surfaces.

The working height determines the ladder size workers need to select. It needs to be tall enough so workers can comfortably reach the work without standing on the top three rungs of an extension ladder or the top step and top cap of a stepladder. Standing too high does not permit workers to support themselves into the ladder and maintain balance.

Duty rating, sometimes called load capacity, is also important. The ladder must support not only a worker's weight but also the weight of clothing, tools and materials used while on the ladder.

The material used to make the ladder also matters. **Fiberglass ladders** are always a good choice and are required when working around electricity because the rails are non-conductive. **Aluminum ladders** can be lightweight and durable but should never be used near energized equipment. **Wood ladders** are also considered non-conductive. While once a common material, wood ladders are no longer manufactured in the U.S. Existing wood ladders require special attention during inspection because they can degrade over time from environmental exposure. Some concerns to watch out for are broken parts, splits and dry rot that could compromise safety.

Safety Inspection

After choosing a ladder, it is NOT time to pop it open and get to work. Now is the time to perform an initial safety inspection. This is a critical step, and it is one of the most frequently overlooked aspects of ladder safety. A proper inspection involves examining every component of the ladder, starting at one end and working systematically through the entire structure. The goal is to ensure that all parts are present, functioning properly, and free from damage or corrosion.

It is important to understand that ladders do not have an expiration date. A properly maintained ladder can be passed on through generations. The reverse is also true: An abused ladder may need to be removed from service after only a few uses. This is why ladder inspection can never be ignored.

Side rails and rungs are the primary load-bearing components. Any cracks, bends or deformations on these components are signs that the ladder should be removed from service. For stepladders, make sure spreaders move freely and lock securely to hold the ladder fully open. For extension ladders, rung locks should engage properly and move smoothly without sticking.

Pay particular attention to the ladder's feet, especially on leaning ladders. The feet are the primary slip-

Why Ladder Safety Matters

resistant component and play a major role in preventing slide-out. Just like the tires on your car, check the tread. Pads should be firmly attached and not excessively worn.

Inspections aren't a onetime event, either. They are part of an ongoing process that continues while setting up the ladder and even while it is being used. Workers should aways be aware of the ladder's condition and confirm that it remains properly positioned and stable throughout the task. It is this ongoing awareness that can help prevent small issues from turning into serious problems.

Setup

In proper setup, the design of the ladder as well as the skill and attention of the workers come together.

To properly set up a step ladder, fully open it with the spreaders locked and all four feet firmly supported on firm, level ground. Even slight unevenness can cause instability, so workers must pay careful attention to foot placement when opening and setting up the ladder. Stepladders should never be leaned against a wall or used in a partially open position. Recent innovation has resulted in stepladders that are also designed for leaning use by the manufacturer.

Extension ladders must be set at the correct angle to optimize strength and stability. Most ladders are designed to be set at approximately a 75-degree angle, and the ladder's labeling often provides specific guidance for achieving this angle.

One commonly taught method for achieving the proper angle is the anthropometric or "firefighter" method. Workers place their toes at the base of the ladder's side rail and extends their arms straight out at shoulder height. The palms should rest comfortably on the side rails while grasping. If only the fingertips reach the ladder rails, the angle is too shallow. If the wrists or forearms contact the ladder, the angle is too steep.

A shallow angle increases the risk of the ladder sliding out at the base. It also places bending stress on the side rails beyond what the ladder was designed to handle. Achieving the correct angle improves resistance to slide-out and helps ensure the ladder can safely carry its intended load without compromising the built-in safety factor.

Make sure extension ladders extend at least 3 feet above the top support point when transitioning on and off the ladder to the elevated surface. This extension provides something for workers to hold onto, especially when descending. Many accidents occur when workers attempt to climb down and realize too late that there is nothing to grab, leading to awkward movements that can compromise footing.

Attempting to adjust or extend a ladder from above is particularly dangerous. Pulling the ladder upward can unlock its rung locks, change the ladder angle, or dislodge the feet, creating a sudden "elevator ride" downward. Extension adders should only ever be extended or adjusted from the ground.

Use

Climbing a ladder safely means always maintaining control and stability. Workers should never stand on the top three rungs of an extension ladder or the top step and top cap of a stepladder. When standing at excessive heights, the ladder provides too little support and the user becomes top-heavy, relying almost entirely on balance rather than contact support with the ladder. The proper highest standing level is identified by the labels on the ladder. If labels are missing, contact the manufacturer for replacement labels and guidance.

With proper positioning, the climber's legs will brace against the ladder and provide stability. On extension ladders, standing too high causes the climber to be too close to the wall or structure, which limits the ability to adjust body position to maintain balance.

Maintaining three points of contact while climbing is a well-known rule and a fundamental OSHA requirement. Simply put, either two feet and one hand or two hands and one foot should always be in contact with the ladder when ascending and descending. By definition, this disallows carrying tools or materials while climbing. Items such as shingles, tools or equipment should never be carried by hand while climbing. Instead, tool belts, ropes or taglines should be used to raise materials once workers are in position.

Other common causes of ladder instability include overreaching and applying excessive force. Tasks such as drilling, pushing, pulling or wrestling with large materials can create sudden shifts in balance. Unwieldy items, such as plywood, should never be handled on a

Why Ladder Safety Matters

ladder, especially with another person pulling from the opposite side, as this creates unpredictable forces that compromise stability.

Many ladder-related incidents occur because workers have become comfortable with improper practices and have "gotten away with it" in the past. Setting extension ladders at shallow angles may feel more comfortable and resemble stairs, but this comfort comes at the expense of safety. Proper climbing technique with a ladder positioned at a 75-degree angle involves controlled stepping upward while keeping the body close to the ladder.

Even short falls can be fatal. Many workers have been seriously injured or killed falling from stepladders only 6 feet high, landing in a way that causes head or spinal injuries. Safety professionals play a crucial role in shaping behavior and managing work practices so that comfort does not override correct technique.

Transport and Storage

How to transport and store ladders is often an afterthought, but it has a direct impact on ladder safety. Ladders transported on vehicle racks should be properly tied down or strapped to prevent movement.

Failing to properly secure ladders can allow them to chatter, bounce or slide, which can introduce wear and impact stresses that crack fiberglass or weaken aluminum rails. Over time, this damage compromises the ladder's load-bearing capacity. Support points on vehicle racks should be designed to distribute weight evenly, and part of the inspection process should include checking for rail damage at those contact points. Ladders should never be allowed to overhang excessively into roadways or create hazards for other vehicles.

Improper storage can also damage ladders and create additional hazards. Stacking materials on top of ladders can crush rails and cause cracks that are not immediately visible.

When ladders are stored vertically, they must be secured to prevent tipping or sliding out. Retail environments provide a useful example, where ladders are stored in vertical bays with racking that prevents them from falling into aisles. Similar principles should be applied on jobsites and in storage areas. Ladders should never be left in aisleways or high-traffic areas where they can be struck, run over or damaged by equipment.

Conclusion

Safe ladder usage requires consistency, training and attention to detail. Safety professionals are in the best position to make a difference by reinforcing these principles with regular and specific training and instruction. Workers must think of ladders as tools that are designed to be used in specific ways. Highlighting the significance of these five steps will prevent ladder accidents.

The American Ladder Institute maintains a host of safety resources, training and curriculum that EHS professionals can incorporate into their own safety initiatives for Ladder Safety Month and all year long.

Ladder safety is not a one-time lesson or a set-it-and-forget-it topic. It's important to select the right ladder for the job—every single time. It's equally important to follow best practices for inspection, use, storage and transportation. Ensuring ladder safety is an ongoing effort to manage behavior, maintain equipment, and ensure that every climb begins and ends safely.

Mike VanBree is director of product safety and engineering at Louisville Ladder Inc. and current president of the American Ladder Institute (ALI), a nonprofit trade association dedicated to promoting ladder safety. Mike's expertise includes climbing equipment and support structures. He specializes in product design, manufacture, warnings, testing, safety analysis, incident investigation, failure analysis, and human interaction with climbing products. Mike has performed hundreds of incident investigations, including product and site inspections, human factors and ergonomics evaluations, mechanical and failure analyses, product testing, and accident reconstruction.