Ladder Safety

More than 2,000 people per day are injured in ladder-related incidents, and the industry is taking major steps to reduce that number. The American Ladder Institute has declared March as National Ladder Safety Month. This collection includes articles about National Ladder Safety Month, ladder safety and the OSHA regulations related to the appropriate and safe use of ladders.

prepared by:

EHS Today

Ladder Safety

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sandy says

Climbing the Ladder to Safety Success

A person dies nearly every day as a result of a ladder-related incident, and thousands each year experience disabling injuries while working with ladders. March has been declared National Ladder Safety Month, and this issue of EHS Today will focus on efforts to reduce and eliminate ladder incidents.

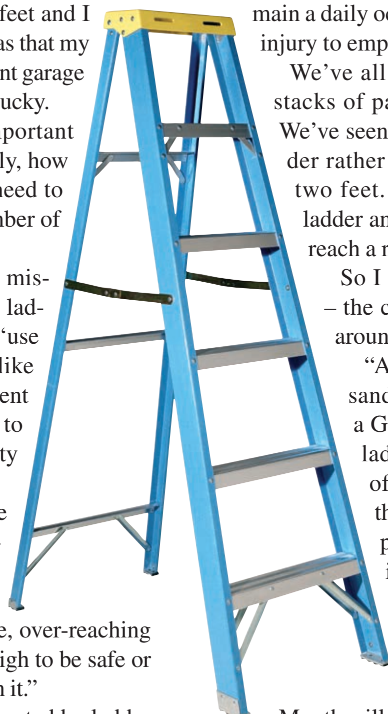
As a tool, ladders have been around longer than the wheel, so you would think we would know how to safely use them at this point. And yet, we still experience an average of 2,000 injures EVERY DAY related to ladders.

I'm no exception; I used a plastic stool with visible cracks in the surface as "a ladder" to try to reach something in my garage this summer. As the stool exploded under my feet and I landed on my @ss, I realized how fortunate I was that my head didn't crack open like a melon on the cement garage floor. Thousands of others each year are not so lucky.

This month *EHS Today* focuses on the important issue of ladder safety: how to use them properly, how to inspect them and maintain them, why we need to choose the correct ladder for the job and a number of other important aspects of ladder safety.

"Some of the most common ways workers misuse ladders begin with selecting the incorrect ladder for the job at hand. The old rule of thumb, 'use the right tool for the job,' applies to ladders like any other tool," says Chris Filardi, vice president of marketing at Werner Co. "The user needs to consider the best style, height and load capacity for the project."

According to Filardi, once that initial choice of the wrong ladder is made, "It's easy to accidentally perform many other ladder safety 'no-no's,' including: placing the base of the ladder too close or far away from the working surface, over-reaching or leaning to one side, standing on a rung too high to be safe or attempting to move the ladder while standing on it."



National Ladder Safety Month is being promoted by ladder manufacturers like Werner and the American Ladder Institute (ALI). The goal is to heighten awareness, reinforce safety training and educate homeowners and working professionals about ladder safety. Much of the focus of the month's initiatives is on training for ladder users and for the workers designated as ladder inspectors. Safety training courses, industry-specific events and downloadable infographics, posters and graphics are available on *LadderSafetyMonth.com*.

Werner offers a number of ladder use and safety resources on its web site as well, as do other ladder manufacturers. Filardi says that in 2016, the Werner Co. team of end-user specialists and its online university hosted over 7,000 training events targeting everyone from individuals to groups of over 1,000 construction workers.

OSHA has made fall prevention in the construction industry a priority for several years in a row, asking construction companies to hold special "stand down" for fall safety events. In fact, ladder safety training has increased significantly in the past 15 years. And yet, falls and ladder-related incidents remain a daily occurrence and are the second-most costly injury to employers and workers. Why?

We've all seen workers using chairs as ladders, stacks of pallets as ladders and tables as ladders. We've seen them overreaching off the side of a ladder rather than climb down and move the ladder two feet. We've seen them prop up a too-short ladder and clamber over the top like a monkey to reach a roof a foot away.

So I asked Filardi: What gives? Why do we – the collective "we" – place our lives at risk around ladders?

"As they say, a picture is worth a thousand words. So, take a moment to conduct a Google image search for the term 'unsafe ladder use.' You'll find literally hundreds of outrageous photos of people that think they are being creative with ladders while putting their lives at risk," he says, adding: "Common sense is still one of the best tools to help people safely use ladders, but we recommend following strict rules on how to use ladders."

Hopefully, National Ladder Safety Month will bring increased awareness to the issue of ladder safety and to the toll that ladder-related incidents take on those who are injured.

Our ladder safety coverage starts on p. 11. **EHS**

Sandy

***Send an e-mail with your thoughts to* sandy.smith@penton.com.**

TALKING LADDER SAFETY WITH AMERICAN LADDER INSTITUTE PRESIDENT RYAN MOSS

The American Ladder Institute, a not-for-profit association of ladder industry leaders dedicated to promoting safe ladder use, has declared March 2017 as ***National Ladder Safety Month***. EHS Today sat down with Moss to hear more about his passion for ladder safety.

By **Sandy Smith**

"Every year there are 300 ladder-related deaths and thousands of disabling injuries related to ladders," says Ryan Moss, president of the American Ladder Institute (ALI), and CEO of Little Giant Ladder Systems. "Without better training and continuous innovation in safety, planning and product design, we will continue to see far too many fatalities."

ALI has declared March to be National Ladder Safety Month. The goal is to heighten awareness, reinforce safety training and educate homeowners and working professionals. Ladder and fall-related injuries are the second-highest in terms of cost for employers (motor vehicle-related accidents are the most expensive, according to Moss).

Moss has been involved with AFI for more than 10 years. As the CEO of Little Giant Ladder Systems, he's been cognizant of safe ladder use for much longer than that.

He told *EHS Today* that a few years ago, he read "Start with Why: How Great Leaders Inspire Everyone to Take Action," by Simon Sinek. The book prompts readers to examine the purpose, cause or belief that inspires them to do what they do every day.

"There has to be more to this than coming to work and making money," says Moss. "So why do we do it?"

He asked his leadership team to read the book with him and determine why they do what they do. Was it just to make a profit, or was it more than that?

Moss and Little Giant Ladders reached out to safety professionals to hear what they thought about ladders and ladder safety.

"Every day, 2,000 people are injured in ladder-related incidents – 100 of them with permanent disabilities – and one is killed," Moss soberly notes. "We were shocked and embarrassed to be involved with an industry that contributed to that many serious injuries."

Learning about the sheer volume of ladder-related injuries made them realize that their "why" wasn't making a great product or a healthy profit, necessarily; it was "preventing injuries and saving lives."

"We listened to hundreds of safety professionals – big, burly construction guys – who shed tears talking about coworkers who were killed in ladder accidents and they were pleading for help to reduce those deaths and injuries," says Moss.

The corporate leaders realized through those discussions that their "why" was even more than just preventing injuries. "Our purpose is to get more people at home tonight safely," says Moss, who adds: "It was a real awakening to the problem. We reached the point where we said 'no more.' We're going to bring awareness to our employees about the issue of ladder safety and not just do some training or create a mission statement."

Moss says employees really engaged with the idea that they had a purpose and that purpose was to built ladders that were inherently safe, helping to save lives and prevent injuries. "They realized: 'If we do our jobs right, someone will go home tonight who wouldn't have gone home.' Every rung, every rivet, every weld matters."

Ladders Are a Tool

Ladders are a tool, and like most tools, they are as safe as the workers using them. In the past 15 years, training has increased, but accidents and injuries have increased as well, says Moss.

So the ladder industry took a look at the five leading causes of ladder-related injuries:

1. Repeated handling of large or heavy ladders can result in back, shoulder and knee injuries, as well as sprains and strains.
2. Overreaching while on a ladder contributes to a large number of injuries. Ladder users stretch out over the side of a ladder rather than climb down and move it over a couple of feet. Doing so throws the user and the ladder off balance.
3. Using the wrong type of ladder. Users try to make a step ladder work when a taller ladder is needed, often standing on the top of the ladder, which is unsafe. Using a chair or a stack of pallets as a ladder falls into this category as well, says Moss.
4. Using the wrong size ladder. Moss says he often sees workers using ladders that stop a foot or two short of a roofline, rather than one that stops above the roof line. The transition from the top of a too-short ladder to the roof can be deadly. Again, choosing a ladder that is too short for the job often leads to standing on the top cap of the ladder, which also can cause a fatal injury.
5. Missing the bottom rung when descending a ladder. Moss says a surprising number of injuries – ranging from twisted, sprained and broken ankles and knees to head injuries and fatalities – have resulted from a worker missing a rung on a ladder.

During National Ladder Safety Month, the ALI members, comprised of most U.S. ladder manufacturers and several component suppliers, will emphasize the following five national initiatives to help promote ladder awareness and safety:

- Decrease the number of ladder-related injuries and fatalities.
- Lower the rankings of ladder-related safety citations on OSHA's yearly Top 10 citations list.
- Increase the number of completed ladder safety trainings on www.laddersafetytraining.org.
- Increase the number of recorded competent ladder inspector trainings.
- Increase the number of companies that inspect and properly dispose of old, damaged or obsolete ladders.

"Ladders have been around longer than the wheel," says Moss. "We need training, awareness and innovation to reduce and eliminate ladder-related injuries and fatalities. We hope National Ladder Safety Month will help us do that."

Safety trainings, industry special events and downloadable infographics, posters and graphics are available on ***LadderSafetyMonth.com***. You can join the ladder safety conversation on social media using *#LadderSafetyMonth* and *#LadderSafety*. **EHS**

For related content, go to:
ehstoday.com/national-ladder-safety-month

THE FUTURE OF FALL PREVENTION

Every ladder accident is preventable, but without better training and continuous innovation in safety planning and product design, fatalities will continue.

By **David Francis**

Every year, over 300 people die in ladder-related accidents, and thousands suffer disabling injuries.

The impact from sprains and strains, broken bones and other more serious disabling conditions resulting from falls from ladders reaches far beyond the injured worker's suffering. The direct compensation and medical treatments associated with falls from elevation cost American businesses $4.6 billion, according to a report from Liberty Mutual published several years ago. That report found that indirect costs associated with increased absenteeism, worker replacement and productivity loss can cost up to two times as much.

How can you help prevent ladder falls? First, you need to understand why they are happening.

There are many potential causes. Workers can their lose footing while carrying tools or materials up the ladder. Grease, ice, mud, snow or water on the rungs can cause slips and falls. Old, poorly maintained ladders can break during use. Ladders can slip out of position if workers are overreaching or the ladder is placed on an uneven surface.

There are many aspects to ladder safety, and addressing them can help you reduce or even eliminate ladder accidents.

Choosing the Correct Ladder

Every ladder safety class should start with a discussion about proper ladder selection. Using the wrong ladder for the job is one of the leading causes of ladder accidents. Choosing the right ladder for the job can be divided into four categories:

Weight rating – Make sure that

the weight rating of the ladder is greater than the weight of the employee and the weight of any tools or materials the employee will be carrying.

I recommend using ladders with a Type I, 250-pound rating. Here's why: I have people ask me, "If I weigh 170 pounds, why can't I use a Type III ladder rated for 200 pounds?"

Type III ladders are classified as homeowner ladders, but these workers are using them on the job. Ladders aren't classified as industrial until you get to the Type I, 250-pound rating. Another reason to use a ladder with a higher weight rating is that ladders tend to be borrowed by whomever needs one in the moment, including a coworker who might weigh more than 300 pounds.

Material – Most job sites require fiberglass ladders because they are nonconductive. People ask me: "If I'm not working around any electricity, why can't I use an aluminum ladder?" My answer is because the ladder is going to disappear the minute he turns around and the next guy might be working on the lights. The best practice is just to have fiberglass on the job.

Length or height – The shortest ladder also is the lightest and often the one the average person would rather carry. Unfortunately, workers rarely come back for the right-sized ladder. Instead, they try to make the short ladder work by climbing on the top step or top cap. Make sure the ladder is tall enough to safely reach the work without climbing on the top rung or top cap of a stepladder or the top three rungs of an extension ladder.

Style – Workers should use the correct style of ladder for the job (stepladder, extension, staircase), and employees should never lean a stepladder against a wall and climb it like an extension ladder. If they need to work on staircase, they should not get creative. Instead, remind them to get an articulating or multipurpose ladder that will adjust to the stairs.

Ladder Inspections Are Important

Ladders should be inspected at three different times: first, when it is received, to make sure it is in good condition and has no freight damage; second, every time it is used and third, on a regular or periodic basis by a competent ladder inspector. A competent ladder inspector is someone who, either by training or by experience, knows what to look for in an inspection and has authority to remove the ladder if he or she finds a problem.

This inspection should be more thorough and detailed than the before-every-use inspection. Both, however, should focus on a few key areas:

Feet – The feet on a ladder are like the tires on your vehicle. They are made of a soft rubber so they will grip the ground, which is good. But soft rubber wears out and becomes slick, which is not good. If the tread is worn on your ladder feet, they need to be replaced. If your company uses a lot of ladders, it's a good idea to have replacement feet on hand.

Side rails – If the side rails are cracked, bent or split, the ladder needs to be replaced. There is no glue or duct tape that will repair broken fiberglass. People often ask if fiberglass is worn out once the fiberglass has faded. Fiberglass breaks down in UV radiation from sunlight and will fade faster if stored on the top of the ladder rack or the sunny side of a building. Fading does not mean the ladder is bad, but excessive fading will cause the surface to split or crack.

Rungs and steps – Again, if they are bent or broken, they are bad and need to be replaced. Also, make sure they are free from any dirt, grease or oil.

Latches, locks, rivets, bolts and ropes – Over time, all the connection points become loose and worn. Make sure that these connections are tight and the ladder doesn't "walk." Latches should move freely and the springs should be in good condition.

Stickers – Labels and stickers should be legible and in good condition; this is easier said than done. Warning labels are on the outside of the rail and often are worn off, faded or gone. In the past, replacement labels have been hard to get because ladder companies didn't know what condition the ladder was in that you wanted to put new labels on. This opinion is changing and companies now are selling replacement label kits on their websites.

Ladder Set Up

Now that you or your employees have picked the right ladder for the job and inspected it, it's time to set it up. Surprisingly, a high percentage of ladder injuries are from handling and set up.

Ladders are heavy and awkward because of their size. Remind employees to always use caution when removing a ladder from a ladder rack. They should find the balance point and carry the ladder with the front slightly elevated.

When setting up, always look up first; know what's above you. Set up on a flat, dry spot. Stake off and tie off whenever possible. Never set up in front of a door that opens outward unless the door is blocked off. If the ladder must set up near a corner or blind spot, make sure the area is properly marked with cones or tape. You don't want someone driving around the corner and taking the ladder out from under the employee using it.

Extension ladders should be set up at 75.5 degrees or a 4-to-1 ratio. For every four feet the ladder goes up, it should come out from the wall one foot. When climbing onto a roof or raised platform, the ladder should be three feet above the roofline.

Never level a ladder by shimming with bricks or boards. The correct way to level a ladder is to dig out the high side instead of building up the low side. This also can be accomplished with leg levelers that can be added to the sides of the ladder.

Safe Climbing

Once the appropriate ladder is chosen and inspected, then it's time to climb the ladder. Here are some ladder use and climbing tips to remember:

• **The three-point rule:** When climbing a ladder, always maintain three points of contact when ascending and descending a ladder (two feet, one hand or two hands, one foot) but what do you do when you stop climbing and start working? Most safety people say you should still maintain three points of contact. Most workers will say that it's hard to get the job done using just one hand.

• The **OSHA** standard does not include portable ladders in the six-foot tie-off requirements, but that has not stopped a lot of companies from including it in their best practices. In fact, some companies require tying off when as low as four feet off the ground.

Never climb a ladder while carrying tools or equipment. Use a rope to raise and lower tools after you have climbed to the desired height.

• **Lashing:** If one ladder is good, then two is not better. Lashing is when two ladders are tied together to reach greater heights. Please never do it!

• **Belt buckle rule:** Never overextend. Workers always should keep the center of their bodies (belt buckle) between the side rails of the ladder. If they can't safely reach something, they need to climb down, move the ladder and climb back up.

• **Face the ladder:** Always climb facing the ladder, wear proper foot wear and make sure all spreader bars and latches are fully locked.

Over the last 10 or 20 years, we have greatly increased the amount of ladder safety training available. The problem is that ladder-related accidents are increasing, not decreasing, so safety training alone is not enough. Ladder design needs to change as well, particularly since engineering out a hazard is at the top of the hierarchy of controls.

Hierarchy of Control

When designing a product or process, it is best to design out all dangers. This process is outlined in the hierarchies of control. Simply put, engineer the danger out. If that is not possible, guard against the danger. If you are unable to adequately guard, then warn, train and provide personal protective equipment.

Unfortunately, long ago, someone decided that ladders couldn't be improved, so they just put a lot of warning labels on them and had countless training meetings where employees were told not to do the things we know they do. Everything else has improved with technology, and I think it's time we start improving ladders.

Understanding how people use ladders and, more importantly, how they get injured using ladders, is key to designing new, safer climbing products. Studying the statistics, we can divide ladder accidents into three categories:

Strains and sprains from unloading, carrying and setting up the ladder. Almost half of the reported injuries involving ladders are caused by the awkward size and weight of the ladder. The easy solution to this problem is to make the ladder lighter.

Using the wrong type or size of ladder for the job. A lot of times, this issue is caused by the first problem. The correct ladder is too heavy, so employees grab the smaller one and try to make it work by climbing too high on the ladder.

> "I was just trying to reach that last thing" is the start to a lot of ladder accident stories.

Falls from height due to overreaching or improper setup. All three types of injuries are painful and costly, but a higher percentage of disabilities and fatalities come from catastrophic falls from height, so let's concentrate on that.

"I was just trying to reach that last thing" is the start to a lot of ladder accident stories. We are trained to keep our bodies between the side rails to prevent us from overreaching. Too often, we stretch to reach instead of climbing down and moving the ladder. No matter how much we train workers, it's human nature.

Another factor in side-tip accidents is how level the ground is in the setup. When working outside, the ground is almost never level. A lot of time, the floor isn't level indoors. To give you an idea of how much level ground can affect tipping, here's an example: If a 28-foot extension ladder is one inch off at the base, the top of the ladder will be 19 inches off of the center of gravity. That puts the top of the ladder completely out of the footprint of the ladder. Even if you are keeping your body between the side rails, your ladder will tip.

When asked what they do to compensate when the ground is not level, most people will say that they use a brick or a board to build up the low side of the ladder. Spending time on a scavenger hunt looking for the right-sized board to level a ladder doesn't sound very productive or safe.

OSHA recommends that workers dig out the high side of the ladder instead of building up the low side. Because this approach is more time-consuming, most people don't do it. After-market leg levelers can be added to the base of ladders, but they have two major problems. First, they add extra weight to an already heavy ladder (remember problem number one) and second, they do not provide any extra stability to the ladder.

Manufacturers have begun adding outriggers to extension ladders. This can increase the side-tip stability by over 600 percent. Because level ground is such a big factor in most side-tip accidents, designing the outriggers to adapt to unlevel surfaces greatly will reduce

the possibility of a tip due to overreaching. Another design improvement to help reduce tips on extension ladders is a self-locking attachment at the top of the ladder that secures the ladder in place.

New Innovations for Ladders

Some new innovations coming from ladder manufacturers combine the platform and handrail system of an enclosed scaffold system with an adjustable fiberglass ladder. These new adjustable safety cages or adjustable enclosed platforms allow workers to move freely with both hands in any direction, rather than forcing them to maintain three points of contact. Handrail systems on the adjustable safety cages removes the need to tie off from above, allowing workers to get the job done quickly and safely, even when there is no way to tie off. Adding an adjustable base allows the ladder to be used safely on uneven ground and stairs. **EHS**

David Francis is national safety director for Little Giant Ladder Systems. He has worked in the ladder industry for over 30 years and travels all over the country performing ladder safety training. He can be contacted via email at dave@ladders.com or www.laddersafetyhub.com.

For related content, go to: *ehstoday.com/unsafe-ladder-use*

MARCH IS NATIONAL LADDER SAFETY MONTH

March is the first National Ladder Safety Month. Each year, 300 workers are killed and thousands more experience debilitating injuries as a result of ladder-related injuries.

EHSToday.com offers a number of resources and photo galleries related to ladder safety:

American Ladder Institute to Highlight Ladder Safety in March 2017
ehstoday.com/national-ladder-safety-month

Ladder Losers [Photo Gallery]
ehstoday.com/unsafe-ladder-use

Attacking Ladder Falls One Rung at a Time
ehstoday.com/attacking-ladder-falls

Don’t Fail at Ladder and Fall Safety [Photo Gallery]
ehstoday.com/ladder-fall-safety

CDC: There’s Nothing ‘Easy’ About Falling Off a Ladder
ehstoday.com/nothing-easy-falling-off-ladder

Idiots on Ladders [Photo Gallery]
ehstoday.com/safety/idiots-ladders-photo-gallery

Meet the Newly Crowned Idiots on Ladders! [Photo Gallery]
ehstoday.com/newly-crowned-idiots-ladders

OSHA Investigation of Fatal Fall Leads to Citations for Electrical Hazards
ehstoday.com/fatal-fall-electrical-hazards

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- **Part Number:** 1910
- **Part Title:** Occupational Safety and Health Standards
- **Subpart:** D
- **Subpart Title:** Walking-Working Surfaces
- **Standard Number:** 1910.23
- **Title:** Ladders.
- **GPO Source:** e-CFR

1910.23(a)

Application. The employer must ensure that each ladder used meets the requirements of this section. This section covers all ladders, except when the ladder is:

1910.23(a)(1)

Used in emergency operations such as firefighting, rescue, and tactical law enforcement operations, or training for these operations; or

1910.23(a)(2)

Designed into or is an integral part of machines or equipment.

1910.23(b)

General requirements for all ladders. The employer must ensure:

1910.23(b)(1)

Ladder rungs, steps, and cleats are parallel, level, and uniformly spaced when the ladder is in position for use;

1910.23(b)(2)

Ladder rungs, steps, and cleats are spaced not less than 10 inches (25 cm) and not more than 14 inches (36 cm) apart, as measured between the centerlines of the rungs, cleats, and steps, except that:

1910.23(b)(2)(i)

Ladder rungs and steps in elevator shafts must be spaced not less than 6 inches (15 cm) apart and not more than 16.5 inches (42 cm) apart, as measured along the ladder side rails; and

1910.23(b)(2)(ii)

Fixed ladder rungs and steps on telecommunication towers must be spaced not more than 18 inches (46 cm) apart, measured between the centerlines of the rungs or steps;

1910.23(b)(3)

Steps on stepstools are spaced not less than 8 inches (20 cm) apart and not more than 12 inches (30 cm) apart, as measured between the centerlines of the steps;

1910.23(b)(4)

Ladder rungs, steps, and cleats have a minimum clear width of 11.5 inches (29 cm) on portable ladders and 16 inches (41 cm) (measured before installation of ladder safety systems) for fixed ladders, except that:

1910.23(b)(4)(i)

The minimum clear width does not apply to ladders with narrow rungs that are not designed to be stepped on, such as those located on the tapered end of orchard ladders and similar ladders;

1910.23(b)(4)(ii)

Rungs and steps of manhole entry ladders that are supported by the manhole opening must have a minimum clear width of 9 inches (23 cm);

1910.23(b)(4)(iii)

Rungs and steps on rolling ladders used in telecommunication centers must have a minimum clear width of 8 inches (20 cm); and

1910.23(b)(4)(iv)

Stepstools have a minimum clear width of 10.5 inches (26.7 cm);

1910.23(b)(5)

Wooden ladders are not coated with any material that may obscure structural defects;

1910.23(b)(6)

Metal ladders are made with corrosion-resistant material or protected against corrosion;

1910.23(b)(7)

Ladder surfaces are free of puncture and laceration hazards;

1910.23(b)(8)

Ladders are used only for the purposes for which they were designed;

1910.23(b)(9)

Ladders are inspected before initial use in each work shift, and more frequently as necessary, to identify any visible defects that could cause employee injury;

1910.23(b)(10)

Any ladder with structural or other defects is immediately tagged "Dangerous: Do Not Use" or with similar language in accordance with § 1910.145 and removed from service until repaired in accordance with § 1910.22(d), or replaced;

1910.23(b)(11)

Each employee faces the ladder when climbing up or down it;

1910.23(b)(12)

Each employee uses at least one hand to grasp the ladder when climbing up and down it; and

1910.23(b)(13)

No employee carries any object or load that could cause the employee to lose balance and fall while climbing up or down the ladder.

1910.23(c)

Portable ladders. The employer must ensure:

1910.23(c)(1)

Rungs and steps of portable metal ladders are corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize the possibility of slipping;

1910.23(c)(2)

Each stepladder or combination ladder used in a stepladder mode is equipped with a metal spreader or locking device that securely holds the front and back sections in an open position while the ladder is in use;

1910.23(c)(3)

Ladders are not loaded beyond the maximum intended load;

Note to paragraph (c)(3): The maximum intended load, as defined in § 1910.21(b), includes the total load (weight and force) of the employee and all tools, equipment, and materials being carried.

1910.23(c)(4)

Ladders are used only on stable and level surfaces unless they are secured or stabilized to prevent accidental displacement;

1910.23(c)(5)

No portable single rail ladders are used;

1910.23(c)(6)

No ladder is moved, shifted, or extended while an employee is on it;

1910.23(c)(7)

Ladders placed in locations such as passageways, doorways, or driveways where they can be displaced by other activities or traffic:

1910.23(c)(7)(i)

Are secured to prevent accidental displacement; or

1910.23(c)(7)(ii)

Are guarded by a temporary barricade, such as a row of traffic cones or caution tape, to keep the activities or traffic away from the ladder;

1910.23(c)(8)

The cap (if equipped) and top step of a stepladder are not used as steps;

1910.23(c)(9)

Portable ladders used on slippery surfaces are secured and stabilized;

1910.23(c)(10)

The top of a non-self-supporting ladder is placed so that both side rails are supported, unless the ladder is equipped with a single support attachment;

1910.23(c)(11)

Portable ladders used to gain access to an upper landing surface have side rails that extend at least 3 feet (0.9 m) above the upper landing surface (see Figure D-1 of this section);

1910.23(c)(12)

Ladders and ladder sections are not tied or fastened together to provide added length unless they are specifically designed for such use;

1910.23(c)(13)

Ladders are not placed on boxes, barrels, or other unstable bases to obtain additional height.

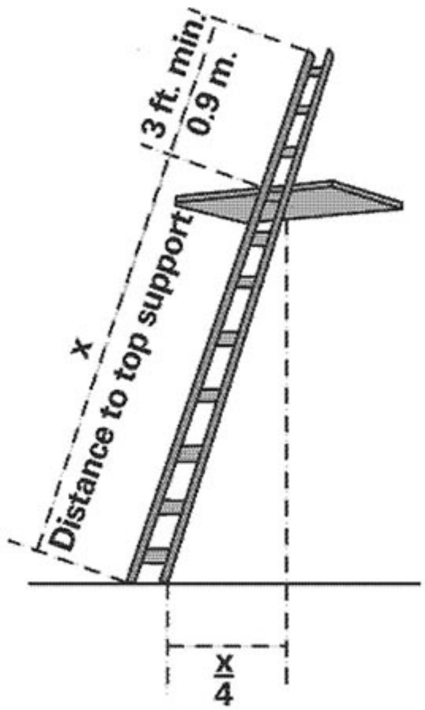

Figure D-1 -- Portable Ladder Set-up

Figure D-1 -- Portable Ladder Set-up

1910.23(d)

Fixed ladders. The employer must ensure:

1910.23(d)(1)

Fixed ladders are capable of supporting their maximum intended load;

1910.23(d)(2)

The minimum perpendicular distance from the centerline of the steps or rungs, or grab bars, or both, to the nearest permanent object in back of the ladder is 7 inches (18 cm), except for elevator pit ladders, which have a minimum perpendicular distance of 4.5 inches (11 cm);

1910.23(d)(3)

Grab bars do not protrude on the climbing side beyond the rungs of the ladder that they serve;

1910.23(d)(4)

The side rails of through or sidestep ladders extend 42 inches (1.1 m) above the top of the access level or landing platform served by the ladder. For parapet ladders, the access level is:

1910.23(d)(4)(i)

The roof, if the parapet is cut to permit passage through the parapet; or

1910.23(d)(4)(ii)

The top of the parapet, if the parapet is continuous;

1910.23(d)(5)

For through ladders, the steps or rungs are omitted from the extensions, and the side rails are flared to provide not less than 24 inches (61cm) and not more than 30 inches (76 cm) of clearance. When a ladder safety system is provided, the maximum clearance between side rails of the extension must not exceed 36 inches (91 cm);

1910.23(d)(6)

For side-step ladders, the side rails, rungs, and steps must be continuous in the extension (see Figure D-2 of this section);

1910.23(d)(7)

Grab bars extend 42 inches (1.1 m) above the access level or landing platforms served by the ladder;

1910.23(d)(8)

The minimum size (cross-section) of grab bars is the same size as the rungs of the ladder.

1910.23(d)(9)

When a fixed ladder terminates at a hatch (see Figure D-3 of this section), the hatch cover:

1910.23(d)(9)(i)

Opens with sufficient clearance to provide easy access to or from the ladder; and

1910.23(d)(9)(ii)

Opens at least 70 degrees from horizontal if the hatch is counterbalanced;

1910.23(d)(10)

Individual-rung ladders are constructed to prevent the employee's feet from sliding off the ends of the rungs (see Figure D-4 of this section);

1910.23(d)(11)

Fixed ladders having a pitch greater than 90 degrees from the horizontal are not used;

1910.23(d)(12)

The step-across distance from the centerline of the rungs or steps is:

1910.23(d)(12)(i)

For through ladders, not less than 7 inches (18 cm) and not more than 12 inches (30 cm) to the nearest edge of the structure, building, or equipment accessed from the ladders;

1910.23(d)(12)(ii)

For side-step ladders, not less than 15 inches (38 cm) and not more than 20 inches (51 cm) to the access points of the platform edge;

1910.23(d)(13)

Fixed ladders that do not have cages or wells have:

1910.23(d)(13)(i)

A clear width of at least 15 inches (38 cm) on each side of the ladder centerline to the nearest permanent object; and

1910.23(d)(13)(ii)

A minimum perpendicular distance of 30 inches (76 cm) from the centerline of the steps or rungs to the nearest object on the climbing side. When unavoidable obstructions are encountered, the minimum clearance at the obstruction may be reduced to 24 inches (61 cm), provided deflector plates are installed (see Figure D-5 of this section).

Note to paragraph (d): Section 1910.28 establishes the employer's duty to provide fall protection for employees on fixed ladders, and § 1910.29 specifies the criteria for fall protection systems for fixed ladders.

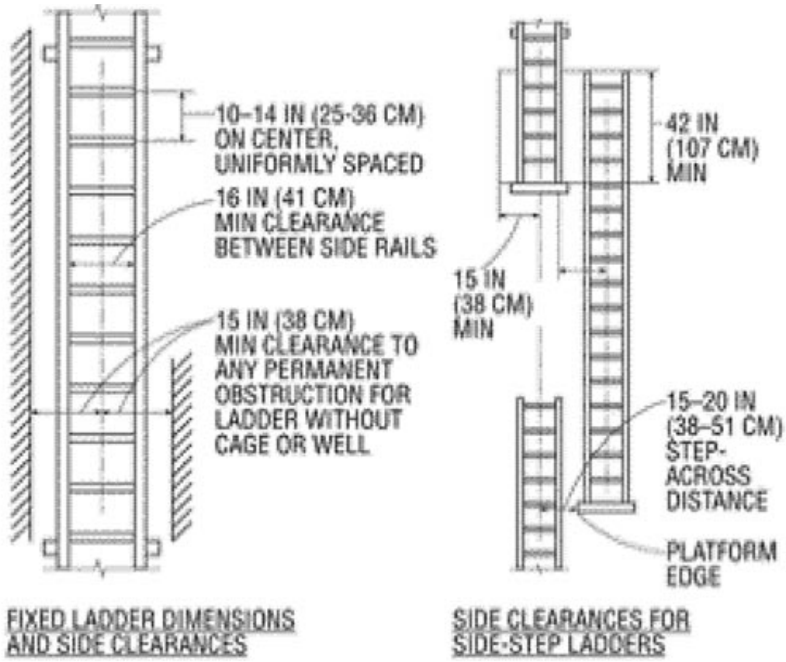

Figure D-2 -- Side-Step Fixed Ladder Sections

Figure D-2 -- Slide-Step Fixed Ladder Sections.

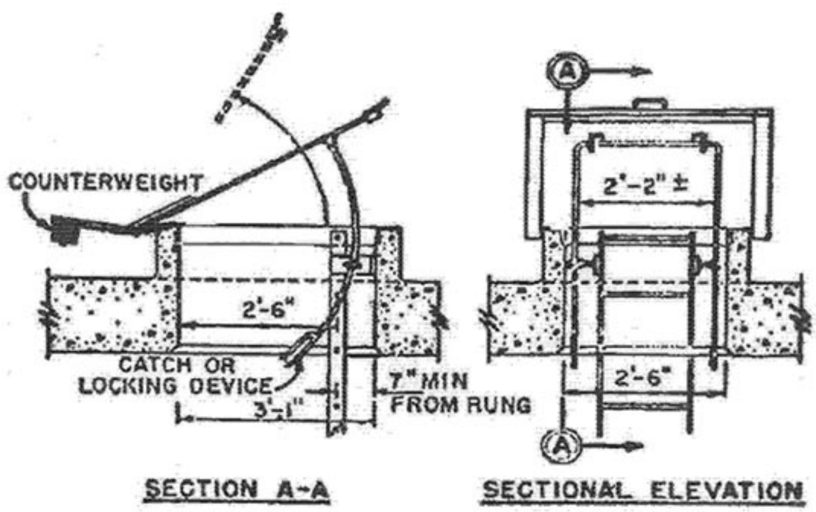

Figure D-3 – Example of Counterbalanced Hatch Cover at Roof

Figure D-3 -- Example of Counterbalanced Hatch Cover at Roof.

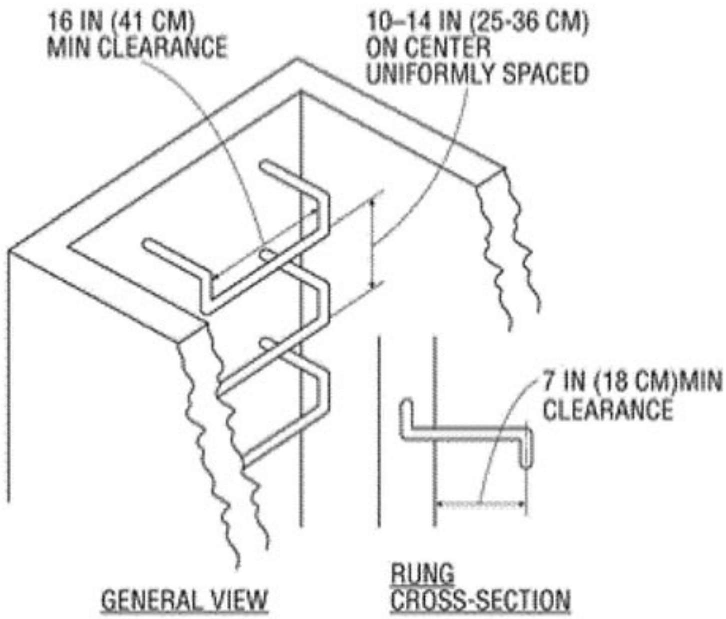

Figure D-4 -- Individual Rung Ladder

Figure D-4 -- Individual Rung Ladder.

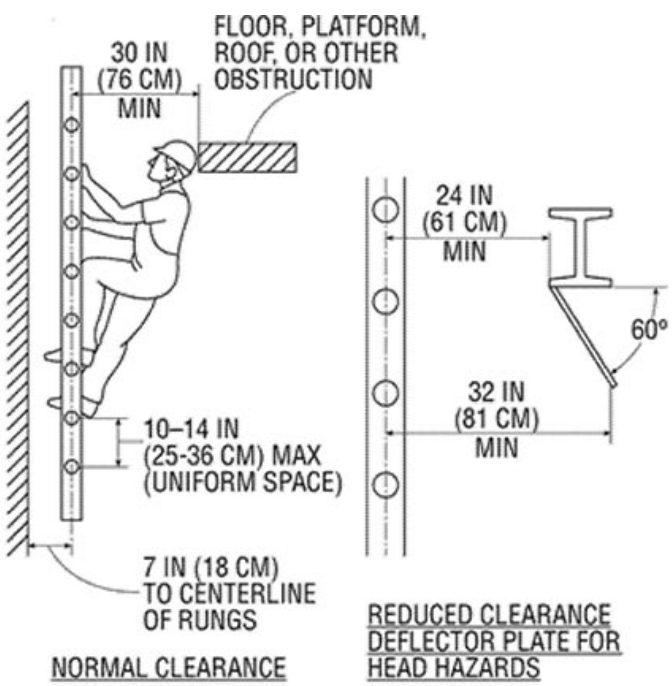

Figure D-5 -- Fixed Ladder Clearances

Figure D-5 -- Fixed Ladder Clearances.

1910.23(e)

Mobile ladder stands and mobile ladder stand platforms-

1910.23(e)(1)

General requirements. The employer must ensure:

1910.23(e)(1)(i)

Mobile ladder stands and platforms have a step width of at least 16 inches (41 cm);

1910.23(e)(1)(ii)

The steps and platforms of mobile ladder stands and platforms are slip resistant. Slip-resistant surfaces must be either an integral part of the design and construction of the mobile ladder stand and platform, or provided as a secondary process or operation, such as dimpling, knurling, shotblasting, coating, spraying, or applying durable slip-resistant tapes;

1910.23(e)(1)(iii)

Mobile ladder stands and platforms are capable of supporting at least four times their maximum intended load;

1910.23(e)(1)(iv)

Wheels or casters under load are capable of supporting their proportional share of four times the maximum intended load, plus their proportional share of the unit's weight;

1910.23(e)(1)(v)

Unless otherwise specified in this section, mobile ladder stands and platforms with a top step height of 4 feet (1.2 m) or above have handrails with a vertical height of 29.5 inches (75 cm) to 37 inches (94 cm), measured from the front edge of a step. Removable gates or non-rigid members, such as chains, may be used instead of handrails in specialuse applications;

1910.23(e)(1)(vi)

The maximum work-surface height of mobile ladder stands and platforms does not exceed four times the shortest base dimension, without additional support. For greater heights, outriggers, counterweights, or comparable means that stabilize the mobile ladder stands and platforms and prevent overturning must be used;

1910.23(e)(1)(vii)

Mobile ladder stands and platforms that have wheels or casters are equipped with a system to impede horizontal movement when an employee is on the stand or platform; and

1910.23(e)(1)(viii)

No mobile ladder stand or platform moves when an employee is on it.

1910.23(e)(2)

Design requirements for mobile ladder stands. The employer must ensure:

1910.23(e)(2)(i)

Steps are uniformly spaced and arranged, with a rise of not more than 10 inches (25 cm) and a depth of not less than 7 inches (18 cm). The slope of the step stringer to which the steps are attached must not be more than 60 degrees, measured from the horizontal;

1910.23(e)(2)(ii)

Mobile ladder stands with a top step height above 10 feet (3 m) have the top step protected on three sides by a handrail with a vertical height of at least 36 inches (91 cm); and top steps that are 20 inches (51 cm) or more, front to back, have a midrail and toeboard. Removable gates or non-rigid members, such as chains, may be used instead of handrails in special-use applications; and

1910.23(e)(2)(iii)

The standing area of mobile ladder stands is within the base frame.

1910.23(e)(3)

Design requirements for mobile ladder stand platforms. The employer must ensure:

1910.23(e)(3)(i)

Steps of mobile ladder stand platforms meet the requirements of paragraph (e)(2)(i) of this section. When the employer demonstrates that the requirement is not feasible, steeper slopes or vertical rung ladders may be used, provided the units are stabilized to prevent overturning;

1910.23(e)(3)(ii)

Mobile ladder stand platforms with a platform height of 4 to 10 feet (1.2 m to 3 m) have, in the platform area, handrails with a vertical height of at least 36 inches (91 cm) and midrails; and

1910.23(e)(3)(iii)

All ladder stand platforms with a platform height above 10 feet (3 m) have guardrails and toeboards on the exposed sides and ends of the platform.

1910.23(e)(3)(iv)

Removable gates or non-rigid members, such as chains, may be used on mobile ladder stand platforms instead of handrails and guardrails in special-use applications.

[39 FR 23502, June 27, 1974, as amended at 43 FR 49744, Oct. 24, 1978; 49 FR 5321, Feb. 10, 1984; 81 FR 82983-82986, Nov. 18, 2016]

Next Standard (1910.24)

Regulations (Standards - 29 CFR) - Table of Contents

- **Part Number:** 1926
- **Part Title:** Safety and Health Regulations for Construction
- **Subpart:** X
- **Subpart Title:** Stairways and Ladders
- **Standard Number:** 1926.1050
- **Title:** Scope, application, and definitions applicable to this subpart.
- **GPO Source:** e-CFR

1926.1050(a)

Scope and application. This subpart applies to all stairways and ladders used in construction, alteration, repair (including painting and decorating), and demolition workplaces covered under 29 CFR part 1926, and also sets forth, in specified circumstances, when ladders and stairways are required to be provided. Additional requirements for ladders used on or with scaffolds are contained in subpart L--Scaffolds. This subpart does not apply to integral components of equipment covered by subpart CC. Subpart CC exclusively sets forth the circumstances when ladders and stairways must be provided on equipment covered by subpart CC.

1926.1050(b)

Definitions. *Cleat* means a ladder crosspiece of rectangular cross section placed on edge upon which a person may step while ascending or descending a ladder.

Double-cleat ladder means a ladder similar in construction to a single-cleat ladder, but with a center rail to allow simultaneous two-way traffic for employees ascending or descending.

Equivalent means alternative designs, materials, or methods that the employer can demonstrate will provide an equal or greater degree of safety for employees than the method or item specified in the standard.

Extension trestle ladder means a self-supporting portable ladder, adjustable in length consisting of a trestle ladder base and a vertically adjustable extension section, with a suitable means for locking the ladders together.

Failure means load refusal, breakage or separation of component parts. Load refusal is the point where the structural members lose their ability to carry the loads.

Fixed-ladder means a ladder that cannot be readily moved or carried because it is an integral part of a building or structure. A side-step fixed ladder is a fixed ladder that requires a person getting off at the top to step to the side of the ladder side rails to reach the landing. A *through fixed ladder* is a fixed ladder that requires a person getting off at the top to step between the side rails of the ladder to reach the landing.

Handrail means a rail used to provide employees with a handhold for support.

Individual-rung/step ladders means ladders without a side rail or center rail support. Such ladders are made by mounting individual steps or rungs directly to the side or wall of the structure.

Job-made ladder means a ladder that is fabricated by employees, typically at the construction site, and is not commercially manufactured. This definition does not apply to any individual-rung/step ladders.

Ladder stand. A mobile fixed size self-supporting ladder consisting of a wide flat tread ladder in the form of stairs. The assembly may include handrails.

Lower levels means those areas to which an employee can fall from a stairway or ladder. Such areas include ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, material, water, equipment, and similar surfaces. It does not include the surface from which the employee falls.

Maximum intended load means the total load of all employees, equipment, tools, materials, transmitted loads, and other loads anticipated to be applied to a ladder component at any one time.

Nosing means that portion of a tread projecting beyond the face of the riser immediately below.

Point of access means all areas used by employees for work related passage from one area or level to another. Such open areas include doorways, passageways, stairway openings, studded walls, and various other permanent or temporary openings used for such travel.

Portable ladder means a ladder that can be readily moved or carried.

Riser height means the vertical distance from the top of a tread to the top of the next higher tread or platform/landing or the distance from the top of a platform/landing to the top of the next higher tread or platform/landing.

Side-step fixed ladder. See "Fixed ladder."

Single-cleat ladder means a ladder consisting of a pair of side rails, connected together by cleats, rungs, or steps.

Single-rail ladder means a portable ladder with rungs, cleats, or steps mounted on a single rail instead of the normal two rails used on most other ladders.

Spiral stairway means a series of steps attached to a vertical pole and progressing upward in a winding fashion within a cylindrical space.

Stairrail system means a vertical barrier erected along the unprotected sides and edges of a stairway to prevent employees from falling to lower levels. The top surface of a stairrail system may also be a "handrail."

Step stool (ladder type) means a self-supporting, foldable, portable ladder, nonadjustable in length, 32 inches or less in overall size, with flat steps and without a pail shelf, designed to be climbed on the ladder top cap as well as all steps. The side rails may continue above the top cap.

Through fixed ladder. See "Fixed ladder."

Tread depth means the horizontal distance from front to back of a tread (excluding nosing, if any).

Unprotected sides and edges means any side or edge (except at entrances to points of access) of a stairway where there is no stairrail system or wall 36 inches (.9 m) or more in height, and any side or edge (except at entrances to points of access) of a stairway landing, or ladder platform where there is no wall or guardrail system 39 inches (1 m) or more in height.

[55 FR 47687, Nov. 14, 1990; 56 FR 47687, Jan. 23, 1991; 58 FR 35184, June 30, 1993; 75 FR 48135, Aug. 9, 2010]

Next Standard (1926.1051)

Regulations (Standards - 29 CFR) - Table of Contents

- **Part Number:** 1926
- **Part Title:** Safety and Health Regulations for Construction
- **Subpart:** X
- **Subpart Title:** Stairways and Ladders
- **Standard Number:** 1926.1051
- **Title:** General requirements.
- **GPO Source:** e-CFR

1926.1051(a)

A stairway or ladder shall be provided at all personnel points of access where there is a break in elevation of 19 inches (48 cm) or more, and no ramp, runway, sloped embankment, or personnel hoist is provided.

1926.1051(a)(1)

Employees shall not use any spiral stairways that will not be a permanent part of the structure on which construction work is being performed.

1926.1051(a)(2)

A double-cleated ladder or two or more separate ladders shall be provided when ladders are the only mean of access or exit from a working area for 25 or more employees, or when a ladder is to serve simultaneous two-way traffic.

1926.1051(a)(3)

When a building or structure has only one point of access between levels, that point of access shall be kept clear to permit free passage of employees. When work must be performed or equipment must be used such that free passage at that point of access is restricted, a second point of access shall be provided and used.

1926.1051(a)(4)

When a building or structure has two or more points of access between levels, at least one point of access shall be kept clear to permit free passage of employees.

..1926.1051(b)

1926.1051(b)

Employers shall provide and install all stairway and ladder fall protection systems required by this subpart and shall comply with all other pertinent requirements of this subpart before employees begin the work that necessitates the installation and use of stairways, ladders, and their respective fall protection systems.

[55 FR 47687, Nov. 14, 1990]

- **Part Number:** 1926
- **Part Title:** Safety and Health Regulations for Construction
- **Subpart:** X
- **Subpart Title:** Stairways and Ladders
- **Standard Number:** 1926.1053
- **Title:** Ladders.
- **GPO Source:** e-CFR

1926.1053(a)

General. The following requirements apply to all ladders as indicated, including job-made ladders.

1926.1053(a)(1)

Ladders shall be capable of supporting the following loads without failure:

1926.1053(a)(1)(i)

Each self-supporting portable ladder: At least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladder shall sustain at least 3.3 times the maximum intended load. The ability of a ladder to sustain the loads indicated in this paragraph shall be determined by applying or transmitting the requisite load to the ladder in a downward vertical direction. Ladders built and tested in conformance with the applicable provisions of appendix A of this subpart will be deemed to meet this requirement.

1926.1053(a)(1)(ii)

Each portable ladder that is not self-supporting: At least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladders shall sustain at least 3.3 times the maximum intended load. The ability of a ladder to sustain the loads indicated in this paragraph shall be determined by applying or transmitting the requisite load to the ladder in a downward vertical direction when the ladder is placed at an angle of 75 1/2 degrees from the horizontal. Ladders built and tested in conformance with the applicable provisions of appendix A will be deemed to meet this requirement.

1926.1053(a)(1)(iii)

Each fixed ladder: At least two loads of 250 pounds (114 kg) each, concentrated between any two consecutive attachments (the number and position of additional concentrated loads of 250 pounds (114 kg) each, determined from anticipated usage of the ladder, shall also be included), plus anticipated loads caused by ice buildup, winds, rigging, and impact loads resulting from the use of ladder safety devices. Each step or rung shall be capable of supporting a single concentrated load of at least 250 pounds (114 kg) applied in the middle of the step or rung. Ladders built in conformance with the applicable provisions of appendix A will be deemed to meet this requirement.

1926.1053(a)(2)

Ladder rungs, cleats, and steps shall be parallel, level, and uniformly spaced when the ladder is in position for use.

1926.1053(a)(3)(i)

Rungs, cleats, and steps of portable ladders (except as provided below) and fixed ladders (including individual-rung/step ladders) shall be spaced not less than 10 inches (25 cm) apart, nor more than 14 inches (36 cm) apart, as measured between center lines of the rungs, cleats, and steps.

1926.1053(a)(3)(ii)

Rungs, cleats, and steps of step stools shall be not less than 8 inches (20 cm) apart, nor more than 12 inches (31 cm) apart, as measured between center lines of the rungs, cleats, and steps.

1926.1053(a)(3)(iii)

Rungs, cleats, and steps of the base section of extension trestle ladders shall not be less than 8 inches (20 cm) nor more than 18 inches (46 cm) apart, as measured between center lines of the rungs, cleats, and steps. The rung spacing on the extension section of the extension trestle ladder shall be not less than 6 inches (15 cm) nor more than 12 inches (31 cm), as measured between center lines of the rungs, cleats, and steps.

1926.1053(a)(4)(i)

The minimum clear distance between the sides of individual-rung/step ladders and the minimum clear distance between the side rails of other fixed ladders shall be 16 inches (41 cm).

1926.1053(a)(4)(ii)

The minimum clear distance between side rails for all portable ladders shall be 11 1/2 inches (29 cm).

1926.1053(a)(5)

The rungs of individual-rung/step ladders shall be shaped such that employees' feet cannot slide off the end of the rungs.

1926.1053(a)(6)(i)

The rungs and steps of fixed metal ladders manufactured after March 15, 1991, shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.

1926.1053(a)(6)(ii)

The rungs and steps of portable metal ladders shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.

1926.1053(a)(7)

Ladders shall not be tied or fastened together to provide longer sections unless they are specifically designed for such use.

1926.1053(a)(8)

A metal spreader or locking device shall be provided on each stepladder to hold the front and back sections in an open position when the ladder is being used.

1926.1053(a)(9)

When splicing is required to obtain a given length of side rail, the resulting side rail must be at least equivalent in strength to a one-piece side rail made of the same material.

1926.1053(a)(10)

Except when portable ladders are used to gain access to fixed ladders (such as those on utility towers, billboards, and other structures where the bottom of the fixed ladder is elevated to limit access), when two or more separate ladders are used to reach an elevated work area, the ladders shall be offset with a platform or landing between the ladders. (The requirements to have guardrail systems with toeboards for falling object and overhead protection on platforms and landings are set forth in subpart M of this part.)

1926.1053(a)(11)

Ladder components shall be surfaced so as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.

1926.1053(a)(12)

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

1926.1053(a)(13)

The minimum perpendicular clearance between fixed ladder rungs, cleats, and steps, and any obstruction behind the ladder shall be 7 inches (18 cm), except in the case of an elevator pit ladder, for which a minimum perpendicular clearance of 4 1/2 inches (11 cm) is required.

1926.1053(a)(14)

The minimum perpendicular clearance between the center line of fixed ladder rungs, cleats, and steps, and any obstruction on the climbing side of the ladder shall be 30 inches (76 cm), except as provided in paragraph (a)(15) of this section.

1926.1053(a)(15)

When unavoidable obstructions are encountered, the minimum perpendicular clearance between the centerline of fixed ladder rungs, cleats, and steps, and the obstruction on the climbing side of the ladder may be reduced to 24 inches (61 cm), provided that a deflection device is installed to guide employees around the obstruction.

1926.1053(a)(16)

Through fixed ladders at their point of access/egress shall have a step-across distance of not less than 7 inches (18 cm) nor more than 12 inches (30 cm) as measured from the centerline of the steps or rungs to the nearest edge of the landing area. If the normal step-across distance exceeds 12 inches (30 cm), a landing platform shall be provided to reduce the distance to the specified limit.

1926.1053(a)(17)

Fixed ladders without cages or wells shall have a clear width to the nearest permanent object of at least 15 inches (38 cm) on each side of the centerline of the ladder.

1926.1053(a)(18)

Fixed ladders shall be provided with cages, wells, ladder safety devices, or self-retracting lifelines where the length of climb is less than 24 feet (7.3 m) but the top of the ladder is at a distance greater than 24 feet (7.3 m) above lower levels.

1926.1053(a)(19)

Where the total length of a climb equals or exceeds 24 feet (7.3 m), fixed ladders shall be equipped with one of the following:

1926.1053(a)(19)(i)

Ladder safety devices; or

1926.1053(a)(19)(ii)

Self-retracting lifelines, and rest platforms at intervals not to exceed 150 feet (45.7 m); or

1926.1053(a)(19)(iii)

A cage or well, and multiple ladder sections, each ladder section not to exceed 50 feet (15.2 m) in length. Ladder sections shall be offset from adjacent sections, and landing platforms shall be provided at maximum intervals of 50 feet (15.2 m).

1926.1053(a)(20)

Cages for fixed ladders shall conform to all of the following:

1926.1053(a)(20)(i)

Horizontal bands shall be fastened to the side rails of rail ladders, or directly to the structure, building, or equipment for individual-rung ladders;

1926.1053(a)(20)(ii)

Vertical bars shall be on the inside of the horizontal bands and shall be fastened to them;

1926.1053(a)(20)(iii)

Cages shall extend not less than 27 inches (68 cm), or more than 30 inches (76 cm) from the centerline of the step or rung (excluding the flare at the bottom of the cage), and shall not be less than 27 inches (68 cm) in width;

1926.1053(a)(20)(iv)

The inside of the cage shall be clear of projections;

1926.1053(a)(20)(v)

Horizontal bands shall be spaced not more than 4 feet (1.2 m) on center vertically;

1926.1053(a)(20)(vi)

Vertical bars shall be spaced at intervals not more than 9 1/2 inches (24 cm) on center horizontally;

1926.1053(a)(20)(vii)

The bottom of the cage shall be at a level not less than 7 feet (2.1 m) nor more than 8 feet (2.4 m) above the point of access to the bottom of the ladder. The bottom of the cage shall be flared not less than 4 inches (10 cm) all around within the distance between the bottom horizontal band and the next higher band;

1926.1053(a)(20)(viii)

The top of the cage shall be a minimum of 42 inches (1.1 m) above the top of the platform, or the point of access at the top of the ladder, with provision for access to the platform or other point of access.

1926.1053(a)(21)

Wells for fixed ladders shall conform to all of the following:

1926.1053(a)(21)(i)

They shall completely encircle the ladder;

1926.1053(a)(21)(ii)

They shall be free of projections;

1926.1053(a)(21)(iii)

Their inside face on the climbing side of the ladder shall extend not less than 27 inches (68 cm) nor more than 30 inches (76 cm) from the centerline of the step or rung;

1926.1053(a)(21)(iv)

The inside clear width shall be at least 30 inches (76 cm);

1926.1053(a)(21)(v)

The bottom of the wall on the access side shall start at a level not less than 7 feet (2.1 m) nor more than 8 feet (2.4 m) above the point of access to the bottom of the ladder.

1926.1053(a)(22)

Ladder safety devices, and related support systems, for fixed ladders shall conform to all of the following:

1926.1053(a)(22)(i)

They shall be capable of withstanding without failure a drop test consisting of an 18-inch (41 cm) drop of a 500-pound (226 kg) weight;

1926.1053(a)(22)(ii)

They shall permit the employee using the device to ascend or descend without continually having to hold, push or pull any part of the device, leaving both hands free for climbing;

1926.1053(a)(22)(iii)

They shall be activated within 2 feet (.61 m) after a fall occurs, and limit the descending velocity of an employee to 7 feet/sec. (2.1 m/sec.) or less;

1926.1053(a)(22)(iv)

The connection between the carrier or lifeline and the point of attachment to the body belt or harness shall not exceed 9 inches (23 cm) in length.

1926.1053(a)(23)

The mounting of ladder safety devices for fixed ladders shall conform to the following:

1926.1053(a)(23)(i)

Mountings for rigid carriers shall be attached at each end of the carrier, with intermediate mountings, as necessary, spaced along the entire length of the carrier, to provide the strength necessary to stop employees' falls.

1926.1053(a)(23)(ii)

Mountings for flexible carriers shall be attached at each end of the carrier. When the system is exposed to wind, cable guides for flexible carriers shall be installed at a minimum spacing of 25 feet (7.6 m) and maximum spacing of 40 feet (12.2 m) along the entire length of the carrier, to prevent wind damage to the system.

1926.1053(a)(23)(iii)

The design and installation of mountings and cable guides shall not reduce the design strength of the ladder.

1926.1053(a)(24)

The side rails of through or side-step fixed ladders shall extend 42 inches (1.1 m) above the top of the access level or landing platform served by the ladder. For a parapet ladder, the access level shall be the roof if the parapet is cut to permit passage through the parapet; if the parapet is continuous, the access level shall be the top of the parapet.

1926.1053(a)(25)

For through-fixed-ladder extensions, the steps or rungs shall be omitted from the extension and the extension of the side rails shall be flared to provide not less than 24 inches (61 cm) nor more than 30 inches (76 cm) clearance between side rails. Where ladder safety devices are provided, the maximum clearance between side rails of the extensions shall not exceed 36 inches (91 cm).

1926.1053(a)(26)

For side-step fixed ladders, the side rails and the steps or rungs shall be continuous in the extension.

1926.1053(a)(27)

Individual-rung/step ladders, except those used where their access openings are covered with manhole covers or hatches, shall extend at least 42 inches (1.1 m) above an access level or landing platform either by the continuation of the rung spacings as horizontal grab bars or by providing vertical grab bars that shall have the same lateral spacing as the vertical legs of the rungs.

1926.1053(b)

Use. The following requirements apply to the use of all ladders, including job-made ladders, except as otherwise indicated:

1926.1053(b)(1)

When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least 3 feet (.9 m) above the upper landing surface to which the ladder is used to gain access; or, when such an extension is not possible because of the ladder's length, then the ladder shall be secured at its top to a rigid support that will not deflect, and a grasping device, such as a grabrail, shall be provided to assist employees in mounting and dismounting the ladder. In no case shall the extension be such that ladder deflection under a load would, by itself, cause the ladder to slip off its support.

1926.1053(b)(2)

Ladders shall be maintained free of oil, grease, and other slipping hazards.

1926.1053(b)(3)

Ladders shall not be loaded beyond the maximum intended load for which they were built, nor beyond their manufacturer's rated capacity.

1926.1053(b)(4)

Ladders shall be used only for the purpose for which they were designed.

1926.1053(b)(5)(i)

Non-self-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).

1926.1053(b)(5)(ii)

Wood job-made ladders with spliced side rails shall be used at an angle such that the horizontal distance is one-eighth the working length of the ladder.

1926.1053(b)(5)(iii)

Fixed ladders shall be used at a pitch no greater than 90 degrees from the horizontal, as measured to the back side of the ladder.

1926.1053(b)(6)

Ladders shall be used only on stable and level surfaces unless secured to prevent accidental displacement.

1926.1053(b)(7)

Ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental displacement. Slip-resistant feet shall not be used as a substitute for care in placing, lashing, or holding a ladder that is used upon slippery surfaces including, but not limited to, flat metal or concrete surfaces that are constructed so they cannot be prevented from becoming slippery.

1926.1053(b)(8)

Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, shall be secured to prevent accidental displacement, or a barricade shall be used to keep the activities or traffic away from the ladder.

1926.1053(b)(9)

The area around the top and bottom of ladders shall be kept clear.

1926.1053(b)(10)

The top of a non-self-supporting ladder shall be placed with the two rails supported equally unless it is equipped with a single support attachment.

1926.1053(b)(11)

Ladders shall not be moved, shifted, or extended while occupied.

1926.1053(b)(12)

Ladders shall have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized electrical equipment, except as provided in §1926.955(b) and (c) of this part.

1926.1053(b)(13)

The top or top step of a stepladder shall not be used as a step.

1926.1053(b)(14)

Cross-bracing on the rear section of stepladders shall not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections.

1926.1053(b)(15)

Ladders shall be inspected by a competent person for visible defects on a periodic basis and after any occurrence that could affect their safe use.

1926.1053(b)(16)

Portable ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, corroded components, or other faulty or defective components, shall either be immediately marked in a manner that readily identifies them as defective, or be tagged with "Do Not Use" or similar language, and shall be withdrawn from service until repaired.

1926.1053(b)(17)

Fixed ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, or corroded components, shall be withdrawn from service until repaired. The requirement to withdraw a defective ladder from service is satisfied if the ladder is either:

1926.1053(b)(17)(i)

Immediately tagged with "Do Not Use" or similar language,

1926.1053(b)(17)(ii)

Marked in a manner that readily identifies it as defective;

1926.1053(b)(17)(iii)

Or blocked (such as with a plywood attachment that spans several rungs).

1926.1053(b)(18)

Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.

1926.1053(b)(19)

Single-rail ladders shall not be used.

1926.1053(b)(20)

When ascending or descending a ladder, the user shall face the ladder.

1926.1053(b)(21)

Each employee shall use at least one hand to grasp the ladder when progressing up and/or down the ladder.

1926.1053(b)(22)

An employee shall not carry any object or load that could cause the employee to lose balance and fall.

[55 FR 47689, Nov. 14, 1990; 56 FR 2585, Jan. 23, 1991; 56 FR 41794, Aug. 23, 1991; 79 FR 20743, Apr. 11, 2014]

Next Standard (1926.1054)

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