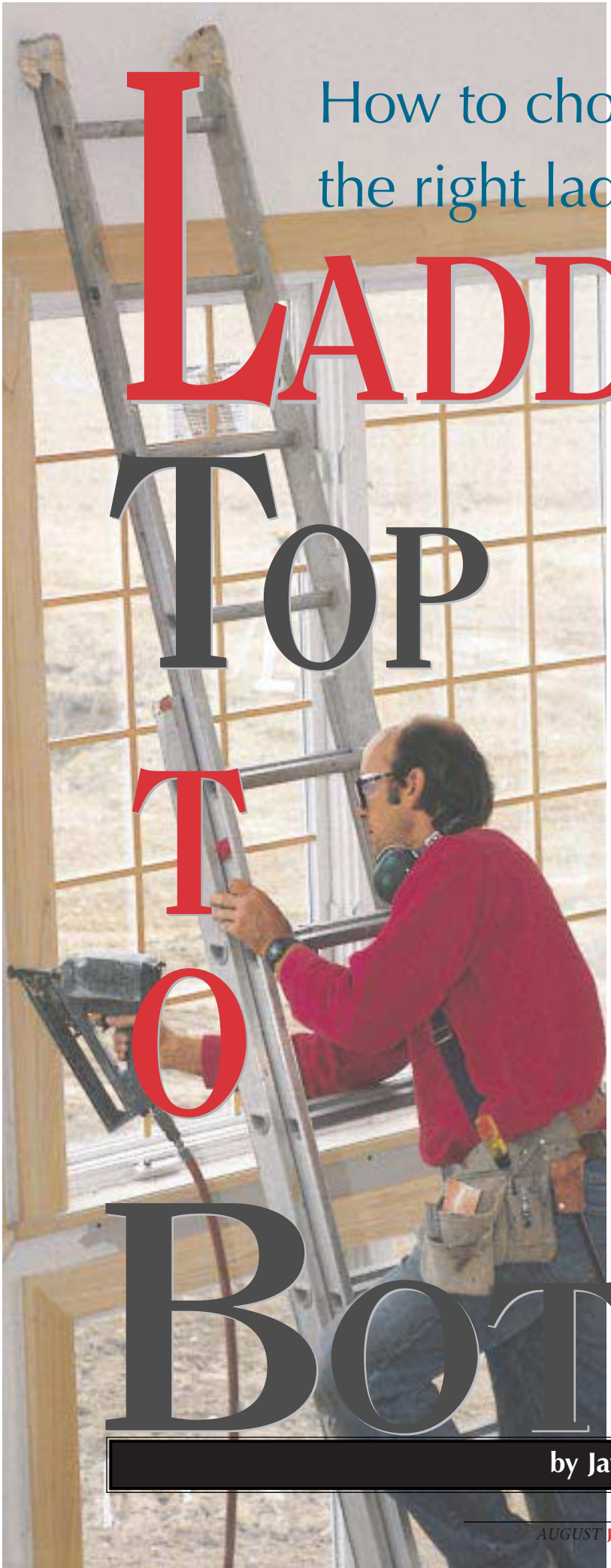

How to choose and use the right ladder for the job

# Ladders — Top to Bottom

by Jay Klein

It's easy to spot a contractor on the road — I just look for a ladder rack on the truck. Most contractors keep at least an extension ladder and one or two stepladders. In this article, I'll explain how these ladders are rated, and how to use them properly.

## Choosing a Ladder

The first step when choosing a ladder is to decide what ladder material best fits your needs: aluminum, fiberglass, or wood (see next page). There are merits to each material, and asking a group of contractors which type of material is the best is a sure-fire way to start an argument.

***Making sense of the specs.*** Ladders are rated according to the amount of weight they will *safely* support. But before choosing a ladder based on the weight of your heaviest employee, remember that you have to also include the weight of any tools he'll be carrying and any ladder accessories being used (ladder jacks and a walking plank, for example).

Since it's difficult to know how much a future employee might weigh, and what accessories will be used, most contractors should consider the highest available rating — Type IA, rated at 300 pounds.

Keep in mind that the rating alone is not the last word when deciding which ladder to purchase. Ladders with the same rating can vary widely in performance, longevity, and cost. I sell five different 32-foot Type IA fiberglass ladders, ranging in cost from $297 to $483.

## Aluminum, Fiberglass, or Wood?

Which ladder material is best? I advise contractors to take their best guess at what jobs they'll be using the ladder for, and choose accordingly.

### Wood

**Pros:** Least expensive, non-conductive
**Cons:** Heavy, requires the most maintenance, deteriorates the quickest when used outside
**Comments:** Wood can be a good choice for stepladders that will live an indoor life. I don't recommend wood for extension ladders. They may be less expensive, but the weight and added maintenance are long-term liabilities that offset any short-term cost savings.

### Aluminum

**Pros:** Lightweight, relatively inexpensive, low maintenance
**Cons:** Electrically conductive, noisy when riding on ladder racks
**Comments:** If you constantly reposition your ladders on the job, or cart stepladders up to the fourth floor everyday, aluminum is probably your best choice. The siding crews I sell to almost always use aluminum ladders. But aluminum is an electrical circuit waiting to happen. If conductivity is an issue, cross aluminum off the list — I know of many factories that won't allow maintenance contractors to bring aluminum ladders to the site.

### Fiberglass

**Pros:** Non-conductive, low maintenance, medium weight
**Cons:** Expensive, heavier than aluminum
**Comments:** A classic case of getting what you pay for. Fiberglass ladders are the toughest on the wallet but won't break your back or electrify your shorts. This is the only type of ladder allowed on many commercial and industrial job sites. I feel fiberglass is the safest type of ladder and well worth the extra cost. If you're only going to buy one ladder, I'd recommend fiberglass.

*—J.K.*

Each one is rated to carry 300 pounds, but the most expensive ladder is far more substantial than the least expensive one, and includes additional bracing, reinforced rungs, and beefed-up side rails.

I try to find out what lifestyle the ladder will live, and recommend accordingly. If the ladder will be supporting ladder jacks and walking planks and will be in use 35 weeks a year (riding on ladder racks during slack time), I recommend buying the best. This type of steady, heavy use will quickly wear out a low-cost ladder, meaning that the ladder will have to be pulled from service much sooner than a more expensive ladder.

If the ladder will be stored indoors, and used a dozen times a year to clean gutters, a lower-cost ladder will be sufficient.

***Determining the correct length.*** A ladder's *working* length is always less than its stated length. For example, a fully extended 32-foot extension ladder typically measures 28 feet. If the ladder rests against the eaves of a roof, it should extend above the eaves at least 3 feet, but not more than 3 1/2 feet. (see Figure 1). For example, if the eaves height is 20 feet, you'll need a 28-foot ladder, which has a maximum working length of 24 feet.

With stepladders, the maximum standing height is always 2 feet less than the stated length. It's hard to miss the label on a new stepladder that reads, "This is not a step." When this label becomes unreadable, OSHA requires it to be replaced. For some reason, I sell a lot of replacement labels for these last two steps (I can't imagine this has anything to do with their being stepped on).

### Proper Use of Ladders

Before setting up any ladder, take a look around and note any potential hazards. Overhead power lines and open electrical service panels should trigger an alarm, particularly for aluminum ladders. But remember, a wood or fiberglass ladder can also conduct electricity if it's wet or dirty.

***Correct angle.*** An extension ladder

should be set up at the proper angle, with a height-to-base ratio of 4 to 1 (for example, the base of a ladder should be 5 feet away from a 20-foot-high building). A quick way to find this angle is to extend your arms straight out until your toes and fingertips just touch the rails (Figure 2).

Ladder rails are designed to function more as posts than beams, with a working angle of 75.5 degrees. Moving the base of the ladder farther away from the structure cranks up the bending stresses in the rails and increases the possibility of failure.

***Level base.*** A ladder should always be set on a level base. I've seen many questionable ladder bases that looked like accidents waiting to happen (Figure 3, last page).

If I have to create a level base, I use a 2x10 at least 18 inches long for each rail of the ladder, or a 2-foot-square piece of 3/4-inch plywood, for each rail of the ladder. Ladder levelers are another option that can save a lot of time, since you don't have to use a shovel to "plant" the lumber base (see "Ladder Accessories," next page).

***Tying off.*** If a ladder is going to be set up and climbed more than once, it should be tied off. I often drive a stake in the ground between the structure and the base of the ladder, and tie off the first rung to the stake with a stout cord (Figure 4, last page). I then tie the top of the ladder to an eye bolt screwed into the fascia.

There are many acceptable variations on this theme. Tying the middle of the ladder back to the structure through rough openings also works. The goal is to secure the ladder, preventing the bottom from kicking out or the top from sliding from side to side.

Don't secure a ladder by running fasteners through the ladder rails. You may split or weaken the rails, and you will definitely void any warranties.

***Traffic control.*** After the ladder is set up, I create a barricade to prevent people from accidentally walking under the ladder. This doesn't require cyclone fencing and razor wire — fluorescent

**Figure 1.** A ladder should extend above the eaves of a roof 3 to 3 1/2 feet (three to four rungs).

**Figure 2.** A quick way to find the proper angle for an extension ladder is to stand with your arms level and fully extended. Your fingertips and toes should just touch the rails of the ladder. The correct base/height ratio is 1 to 4.

flagging tape will do.

***Don't overreach.*** Overreaching is the major cause of ladder-related injuries. The rule of thumb I use is to keep your belt buckle between the rails. Anyone who has ever been on a ladder has probably stretched this one a bit, but it's sound advice to give to your employees. When in doubt, move the ladder over.

A stepladder's load rating is based on a fully opened ladder (with the spreaders locked) set on a firm level surface. A stepladder is not designed to be used in a closed position, leaning against a wall.

***Not a scaffold plank.*** *Never* use a ladder — extended or not — as a plank. Regardless of whether it's a wood, aluminum, or fiberglass ladder, the rail extension system is not designed to function as a plank, and could easily fail. Using a single section from an extension ladder to "stiffen" a wooden plank is not acceptable either. The ladder may not fail, but the stresses will loosen up critical connections within the ladder, and quickly convert a nice, tight ladder into to one that sways in the breeze.

## Inspecting a Ladder

A ladder should be inspected every time it's set up. In the field, this means making sure the locking mechanisms work, there are no visible defects, and if the ladder is in use, that it's correctly and securely positioned and footed. Think of it this way: If it were your first trip to a job site and you were asked to climb a ladder leading to the roof, wouldn't you look it over before you began your climb? An inspection need only take a minute or so. My credo is "if it don't look right, then it probably ain't."

I start an inspection from the ground, and work up. I check the ladder's safety feet, making sure the rivets are sound and intact. Next, I examine the rails for splits, bends, cracks, or any missing or damaged rivets. I make sure all the steps or rungs are in good shape and check that all bracing members are in place. If it's an extension ladder, I examine the locking braces (often called dogs) and

# Ladder Accessories

## Ladder Jacks

Ladder jacks attach quickly to a ladder and will typically support up to 250 pounds per bracket. Fall protection is required above 10 feet. Cost is around $135 per bracket. Qual-Craft Industries, Inc., 1551 Central Street, Stoughton, MA 02072; 781/344-1000.

## Conduit Holder

Aluminum conduit holders attach to a stepladder with thumbscrews and provide a firm base for sawing conduit. They can be quickly installed and removed. Around $11 per pair from Werner Ladder Co., 93 Werner Road, Greenville, PA 16125-9499; 724/588-8600; www.werner.com.

## Ridge Hooks

Ridge hooks provide a quick way to access a steep roof. To prevent excessive stress on the center of the ladder rung, the manufacturer recommends using two ridge hooks per ladder. $15 each, from Qual-Craft.

## Ladder X-Brace

Rincon's X-Brace can stiffen a tired stepladder that's beginning to sway in the breeze. It quickly attaches to the back of the ladder with four fasteners. Around $10 from Rincon Industries, Inc., 16885 Via Del Campo Ct., Suite 210, San Diego, CA 92127; 800/575-2064; www.rinconind.com.

## Ladder Levelers

Adjustable leg levelers eliminate the need to carve a level base out of uneven terrain. About $90 from W. Taylor Enterprises, Inc., P.O. Box 3402, Windsor Locks, CT 06096; 888/748-7366.

## Standoffs

Ladder standoffs (right) increase stability, and can provide improved reach at overhangs (when installing gutters, for example). A corner model allows the ladder to be positoned at the outside corner of a building (below). Cost is $40 to $85, depending on model. From Qual-Craft.

## Railing Jig

The Railing Jig is a vertical post that attaches to the outboard side of a ladder jack. It improves the usefulness of ladder jack staging by providing a place to attach safety rails and a work platform. It attaches to most standard ladder jacks on the market. $495 per pair from Railing Jigs, Inc., P.O. Box 630, Newport, OR 97365; 800/616-5447; www.newportnet.com/railingjig.

## Ladder Booties

Ladder booties slip over the rail ends of extension ladders to prevent the rails from marring the surface of the building. About $10 from Werner.

## Ladder Don'ts

**Figure 3.** A shaky footing (upper left) is an accident waiting to happen. Dig out a level area and use a 2x10 pad. Driving a fastener through the ladder rail (upper right) weakens the rail and voids the manufacturer's warranty. Never use a ladder in a horizontal position (bottom left): You'll weaken the connections between the rungs and the rails, void the manufacturers warranty, and risk an OSHA fine. Don't make creative repairs (bottom right) — you'll be assuming all the liability if the ladder fails. Instead, you should destroy the ladder.

make sure they function properly, and aren't bent or damaged.

Both OSHA and ANSI (American National Standards Institute) require that all ladder labels should be in place and readable, or the ladder shouldn't be in use. If the labels aren't up to snuff, call your distributor and order new labels.

If any questionable items are discovered during the inspection, the ladder should be tagged as "out of service," and should be re-inspected by a competent person within the company who will decide whether the ladder should be repaired or discarded.

### Repairing a Ladder

When repairing a ladder, I always recommend using the original manufacturer's replacement parts. Using generic repair parts can cloud the issue of liability should the part or ladder fail. Avoid the temptation to make "creative" repairs. Even if the ladder is out of warranty, the improvised repair will not pass an OSHA inspection. On-the-spot repairs usually aren't as strong as you think they are.

Repair parts typically include rungs, lock assemblies, safety shoes, guide brackets, end caps and closures, rope and pulley assemblies, and stepladder spreaders. Your ladder manufacturer's catalog will list all the parts available for your particular ladder.

Many ladder manufacturers will perform repairs, and you should check with your dealer about the costs and shipping details. Keep in mind, though, that if the manufacturer deems the ladder beyond safe repair, they probably won't return it.

***No paint.*** Also, a ladder should *never* be painted. Paint can hide defects that might otherwise be visible. Typically, it's wood ladders that get a paint job, but the "no paint" rule applies to all types of ladders.

Eventually, a ladder reaches a point where it's just plain worn out. Deciding when a ladder should be taken out of service is a subjective decision. If you're not sure whether the ladder is worn out, a good distributor will offer to inspect the ladder for you.

If you decide to take a ladder out of service, I advise destroying the ladder. There was a company in my area that put a non-repairable ladder out with the trash. A scavenging eye spotted it and decided to squeeze some more life out of the tired ladder. The user was injured when the ladder failed, and successfully sued the contracting company.

Don't let your ladder become your liability. Every time you set up a ladder, evaluate the surroundings, and give the ladder a quick inspection.

**Figure 4.** You can quickly secure the base of a ladder by tying off the first rung to a stake driven in the ground.

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