Nearly 30 years ago, when lasers were first introduced to the jobsite arena, the potential of this capability was greatly undermeasured—not to mention that the vast expansion that the laser industry would later experience was not even contemplated. Today, nearly all contractors have at least one laser tool at their day-to-day disposal.

When the laser was first introduced, it cost an average of $20,000. Not only were they heavy and awkward to carry, they needed some type of external power source.

Currently, the costs for construction lasers range from several hundred dollars to several thousand dollars and are used for numerous tasks such as projecting a horizontal reference for excavation, form work, concrete pouring, suspended ceilings, flooring, installations, vertical references and projecting right angles for a variety of alignment work for batter boards, pre-cast elements, ceilings, tiling and installations—they even measure distances!

The use of lasers can help maximize profits, making difficult two person measuring jobs of the past a one-person (with a laser) job of today. Using the appropriate laser tool can also be more accurate and thus reduce needed materials and personnel. In addition, most laser tools are very user-friendly. They can reduce the user’s chance for error when measuring, thus allowing for a drastic reduction in costly rework projects. After all, why should you complete a job twice when you get paid only once?

Selecting the right laser for the job is an essential piece of the puzzle. What follows is a brief overview of the various types of lasers available in the marketplace today.

**Type of Projection**

**Point Laser.** The projection beam can be seen on your target as a laser point. Depending on the type of laser used and
the ambient lighting conditions, the point laser is typically ideal for measuring distances up to 100 feet.

**Line Laser.** The line laser is the newest form of projection where the laser point is diversified into a line. This line can either be horizontal or vertical. The advantage of this laser is that the projected line is very fine. Unfortunately, under average lighting conditions, the line laser cannot be seen farther than approximately 40 feet from the source. The line laser can be projected horizontally, vertically or even at a sloped angle.

The visibility, and thus the range of the laser, depends on the type of projection and also on the type of laser diode used (670, 650, 635 or 530 nanometers—the lower the number, the better the visibility), ambient light condition and the target surface. The visibility of the laser beam can be improved by wearing specially designed laser visibility goggles.

**Type of Leveling**

**Manual Leveling.** Manual leveling lasers require leveling by hand, with screws and bubbles as references.

**Manual Leveling (with automatic leveling cut-off).** Manual leveling lasers with automatic cut-off are leveled by hand. This
Self-leveling usually requires some sort of bubble, but the tool will automatically switch off if brought out of level by a heavy vibration or jolt. This feature is an added benefit to a laser product (as you want to be certain that the laser is consistent and on target at all times).

**Semi-Automatic Leveling.** Semi-automatic leveling lasers need some pre-leveling by hand and bubble. Within a certain (usually small) range, a compensator system will take care of a precise leveling job. This fine adjustment is done either by a pendulum or a liquid.

**Fully Automatic Leveling.** As the name suggests, these lasers are fully automatic and do not need to be pre-leveled if they are set on a rough-leveled floor, tripod or other accessory. These tools offer the highest degree of user comfort.

In addition to the fully automatic lasers currently on the market, there are also laser positioning tools that offer a combination of the above mentioned leveling systems. For example, automatic pre-leveling for user comfort and a compensator for high accuracy are a few features offered by these lasers.

**Type of Leveling**

**Laser Levels.** The simplest form of a construction laser is a tool that looks similar to a carpenter level with a built-in point or line laser. Important features for the laser level are the accuracy of the bubble, the alignment of the laser to the bubble and the housing, the visibility of the laser beam and the accessories. Laser levels can typically be used to measure distances up to 100 feet.

**Multi Beam Lasers.** These are laser tools that concurrently emit multiple laser beams for leveling, plumbing and projecting right angles. Many of these tools offer a large automatic leveling range. The range of the multi-beam tool is similar to that of the laser level. Important features of this type of tool are the available automatic leveling range, the visibility of the laser beams and the accessories.

**Rotating Lasers.** The rotating laser usually has a rotating head that sends the laser light in a full circle around the tool. Rotating lasers can be divided into two main categories: outdoor and interior.

Due to the outside lighting conditions and inability to locate the beam when measuring long distances, outdoor lasers usually incorporate an invisible laser beam. Outdoor lasers typically cost less than interior lasers. To locate the invisible laser in outdoor conditions, a “detector” or “receiver” is used for easy identification. This detector can “see” the invisible laser light and guide the user into the laser’s plane.

Interior lasers, on the other hand, usually offer a 90-degree reference or plumb beam for determining right angles, changeable rotation speeds and scanning features where the beam moves forward and backward over a certain area to improve the user’s visibility. Most rotating lasers can be used to project a horizontal plane, yet some are specially designed for vertical plane applications.

Other lasers offer a combination of horizontal, vertical and slope plane modes.

When purchasing a laser, it is important that you get a tool that can perform the required tasks, that is easy to handle and that can maintain accurate measurements. (This accuracy is an angular error, so the maximum offers increases with the distance.)

In measuring distance, it is pertinent to mention that every laser “grows with the distance,” meaning that the farther you are away from the tool, the bigger the laser spot or line will be. The smaller the laser at short distance, the faster it grows. The bigger you start, the smaller the growth rate.

Knowing that, prior to measuring, remember to mark the center of the laser beam, because you do not want to add the growth to your tolerance.

Nobody can foresee what laser measuring tools will look like 30 years from now, or if the same technology will be used, but the trend for the nearby future looks like it is leaning toward lower, more competitive prices and increased functionality of the tools. That could mean that there will be even more lasers used tomorrow than today. The future is ours to mold—it’s a good thing we have lasers to help us create it!

**About the Author**

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