



⌘ Using a drill bit flaring kit can help minimize leaks and speed up the flaring process. Image courtesy of RectorSeal, LLC.

## Using a Smarter Tool for Flaring Lineset Connections

Technology saves HVACR techs time and money.

BY JAMES BOWMAN

I always considered a “smart” tool to be digital, intuitive or something featuring high technology, such as a color touch screen, Bluetooth connection or Wi-Fi.

However, there are other definitions of “smart.” Tools developed to supplant older methods in order to save time and money is another kind of smart that subscribes to the work smarter not harder philosophy. Therefore, I continuously upgrade my toolbox with tools that make HVAC service or installation easier. For example, one of my earliest smart tool decisions was upgrading from an analog to a digital meter. I also traded my grandad’s pulley pullers for a deluxe hub and fan puller set more than 20 years ago. In fact, many of our service van’s smartest tools were invented by HVAC technicians to make their lives easier or save job time.

Likewise, ductless systems’ North American popularity rise has inspired new tools that make installation easier. Flaring, for example, is one part of ductless system installation we love to



⌘ Flaring drill bits save time and money. Image courtesy of RectorSeal, LLC.

hate. Flaring also leads to the majority of refrigerant leaks that occur within the first year after installation. Manufacturers estimate as many as 30% of flares leak in their first year.

There are many types of cold flaring methods,

such as double flares, 22 degrees, 37 degrees and 45 degrees. Double flares typically don’t leak, but they take at least 5-minutes to create onsite. Unfortunately, most of us prefer the quicker 1-minute flaring block to create 45 degree flares.

My first flaring tool was a two piece block-and-yoke set. Now there are smarter versions, such as deluxe single-piece models with an onboard depth gauge, elliptical cones and a clutch handle.

Despite these smarter tool technologies, flares still have a great tendency to leak. I believe ductless system flares leak for three reasons:

→ **Technician error**—Technicians don’t prepare or execute the flare properly. Leaks can occur from over-flaring, under-flaring, not reaming out burrs, incorrectly using a torque wrench during system connection, and a host of other shortcuts and mistakes.

→ **Heat pumps**—Ductless systems are now increasingly used for heating. This expands the flare formation beyond its cold flare shape. Heat expansion can exacerbate microscopic copper surface imperfections and result in a leak.



⌘ A completed flare produced with a drill bit flaring and heat. Image courtesy of Copper Development Association.

→**High pressure refrigerants**—Ductless system manufacturers used to require flares to withstand 400-500 psi. Because of the predominance of flare leaks and the inherent high pressure of R-410A, most manufacturers now require flares to withstand 650 psi in nitrogen leak tests.

Now there's a smarter tool than flaring blocks because it produces flares that minimize leaks and make the flaring process 90% faster. The tool typically comes from several manufacturers as a set of five drill bits. One set is bell-shaped, color-coded, size-inscribed flaring bits designed for 1/4, 3/8, 1/2, 5/8 and 3/4-in. copper or aluminum tubing. The flaring process requires just 5 seconds to complete using a (minimum) high rpm, 12 V drill or impact driver. Spinning bits form the tube opening into a flare with heat. This eliminates the tubing splits, burrs, blemishes or uneven edges that typically contribute to flare fitting connection leaks.

The friction improves flares two ways. First, the many revolutions burnish the copper surface to remove imperfections. Second, friction heats the copper, essentially pre-expanding it, so that when tightened to the male fitting, a perfect match is created. Now when the system cycles from cooling to heating mode, no leaks occur as a result of heat expansion.

Besides quality control, speed is a selling point too. An example is a contractor who installs 300 mini-splits in a multi-family housing facility. A conventional flaring block that requires one-min/flare would take 20 hours of labor (300 units x 4 flares/unit = 1,200 flares or 1,200 minutes ÷ 60 minutes = 20 hours). In contrast, a high-speed drill bit flare process takes only 5 seconds and adds only 1.6 hours of labor (1,200 flares x 5 seconds = 6,000 seconds or 100 minutes ÷ 60 minutes = 1.6 hours). Thus, the drill bit flare method can be up to 12 times faster than traditional flaring block methods.

So, tools can exhibit smart, intuitive high-technology or they can just be smart ideas for improving quality control and saving job costs and time. When it comes to flaring linesets for ductless systems, a technician would be smart to at least try a tool that could minimize leaks and cuts preparation time. 🌀

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