

HVAC&R NEWS

AN AIRAH PUBLICATION



Sealing the deal

A closer look at
press fittings

Skills WORKSHOP

Cleaning
commercial
kitchen exhausts



WHERE TO NOW?

The path forward for refrigerant transition

SEALING THE DEAL



Image courtesy of Conex Bänninger.

Using press fittings for pipework instead of welding or brazing is becoming increasingly popular in the plumbing industry. So why the hesitation in HVAC&R? Louise Belfield reports.

Press fittings are a way of connecting refrigeration and plumbing pipework using special tools to apply pressure to the pipe, rather than brazing with an oxy-acetylene torch.

A.G. Coombs' National Operations QA Officer Chris Cartwright says press fittings work in a similar way to push fittings. "However, press fittings work with the aid of a mechanical press gun that clamps the O-ring within the fitting, sealing the fitting to the pipe," he says.

Cartwright says he has used this system successfully for heating and chilled pipework, hot and cold water, natural gas, and refrigeration gas lines, and "it can also be used for applications that need stainless steel pipe lines".

Reece Conex Bänninger Specification and Technical Manager Steve Lowry is also familiar with the flame-free method of joining copper and stainless steel pipe together. He explains that for a three-point press system, the press fitting is installed with a tool that performs a mechanical press on both sides of the bead and one press crimping the O-ring.

"This provides a permanent and secure joint," Lowry says.

Some of the primary uses for press fittings include water, gas, refrigeration and air conditioning.

"However, we are now receiving enquiries more often for projects where hydrogen and other special mediums are being used," he says.

"We can accommodate these requests as we have access to press fittings that incorporate O-rings manufactured from a range of materials including EPDM, HNBR, and FKM."

Rapid Locking System Marketing Manager Jessica Slaughter, based in the US, says press fittings are "suitable for high-pressure refrigeration, as well as industrial gases such as nitrogen, argon, helium and oxygen (non-medical)".

However, although press fittings are becoming increasingly popular in several sectors, there has not been the same level of uptake in the HVAC&R industry. Here, the debate still continues over whether a brazed joint is more reliable than a pressed one.



Correct preparation is essential to guarantee a good seal.
Image courtesy of RLS.

HOW DOES IT WORK?

The pressing procedure is similar to the one used with water press fittings, says Slaughter. "However, they were developed to withstand the high pressures found in HVAC&R systems," she says.

"The fittings are soft annealed copper, which, when pressed onto tube, results in a permanent mechanical joint. Our design has one seal on each end and when pressed, these create two 360-degree bands around the copper tube, allowing full contact on every part of the tube.

"The copper tube ends are first prepped the same way as you would with brazing (sanding, deburring, etc.). With press, you also need to mark for insertion depth to ensure your tube is inserted past the seal, but not too far past so that you can insert the opposite tube end appropriately.

After prep, which I want to mention is extremely important, you are good to place your fitting over the tube, and press.

"Another measure we take to ensure the press is adequate is to use our press gauge over the two circular bands the jaws make to double check the press is complete."

THE UPSIDE


Some benefits in for choosing press fittings over brazing, Cartwright says, include not having to lug around oxy-acetylene gear for brazing, not having to apply for hot works permits, and not having to worry about any of the other safety issues that come with working with flammable gases.

Steve Lowry agrees, saying not only can you avoid the cost of hiring and hauling around

oxygen and acetylene bottles, but press fittings are also "super-fast to install and look really neat and attractive in exposed areas; there's less time required training the workforce to join pipes and or fittings (the skill isn't as complex as a traditional brazed weld); and there is no need to purge the pipeline when only press fittings are installed.

"Press fittings have numerous advantages over traditional methods of joining tube, [not least being] a reduction in labour costs," he says.

Slaughter says press fittings also connect in 10 seconds; are UL-listed to 700psi working pressure; provide safer conditions [no fire hazards]; provide more flexible access to job sites; come with a warranty; are available in the largest size ranges (from US $\frac{1}{4}$ inch to 2-1/8 inch) and are compatible with all major tool brands.



One downside of the press fittings is the additional cost, though there are savings in labour and time.
Image courtesy of Conex Bänninger.

THE DOWNSIDE

The drawbacks of press fittings in comparison to brazed fittings are that they do come at a higher cost, says Lowry.

“This is due to the additional materials, technical requirements in manufacturing, and R&D costs,” he says. “However, the time and materials saved during installation, such as nitrogen or purging pipework, bottle hire and silver solder often offset the cost difference.”

But this offset needs to also take in other considerations, says Cartwright.

“It is very important to make sure the fittings are kept clean at all times,” he says, “you need to buy or hire a press fittings gun, and it can be difficult to notice if a press was missed in installed pipework.”

Slaughter agrees that the higher cost can be a downside to adopting press fittings, but that “this can be rebutted by labour and time savings”.

Press fittings are currently listed for A1 refrigerants, and it is expected that by early 2024 they will be certified for use with flammable refrigerants, says Slaughter.

“R454B is one of the fluids we are ensuring compatibilities with, as we know this is a replacement for R410A. The fittings and gaskets are already compatible with these fluids; it’s just a matter of completing the testing and earning the certification.”

WHY THE SLOW UPTAKE IN HVAC&R?

“Press fittings are well established for water and gas applications, having been available in that market for 40-plus years,” says Steve Lowry. “However, press fitting for refrigeration and air conditioning were introduced much later ... so it is still fairly new technology in the ACR market.

“As an industry that is quite traditional in brazing and flaring, some installers may feel reluctant to try new methods, particularly as they are dealing with higher pressure systems and misconceptions around the risk of leaks.

“[But] more installers are adopting the technology, because when it comes to pressing fittings, you have peace of mind knowing that every single joint has been done exactly the same in every installation. What you’ll find is installers try it once and never go back.”

Slaughter says RLS is also seeing more adoption every year, as trust builds.

“Press for refrigeration has been around for just over eight years,” she says.

“It is true that adoption started slow, with hesitations to the technology. However, in the last eight years we have had over 15 million fittings in the market, globally ... with millions of positive experiences. It is a matter of awareness, training and education, and getting the product into the contractors’ hands.”

Cartwright agrees the reason press fittings haven’t been as widely used in HVAC&R as in other sectors is mostly the cost aspect and the lack of confidence in the join sealing for a lifetime.

“[But] press fittings have been a game changer, similar to when they introduced silicone. Plumbers went from soft soldering gutters to using silicone, which in many ways resembles the same benefits.

“With the time restraints on building sites, the skill shortages in the industry, and the constant push to get jobs completed in record time it has been a real help.”

INTO THE FUTURE

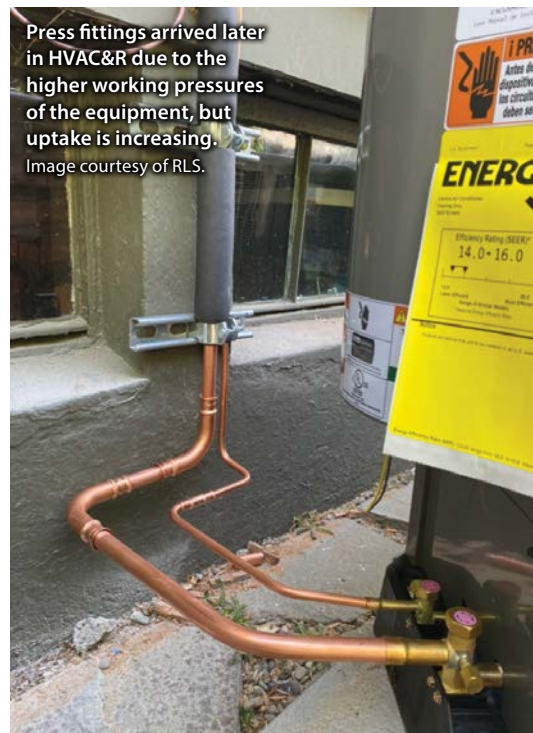
Slaughter says it was noticed back in 2008 that there was a void in the HVAC&R market for this technology compared to the plumbing industry, and that new technology was needed.

“After years of design and extensive testing, the press was introduced into the market in 2015. HVAC&R pressures are much higher than water (200psi), so the engineering process was and still is extremely meticulous.

“To some the adoption may seem slow, but we know how particular trades are about their work as well. The main obstacle is training and awareness of the product. It is a simpler process than brazing and offers many benefits, but if you have not experienced the reliability and ease yet, then one might be hesitant.

“The best strategy for adoption is training and getting the tool and fittings in [trades’] hands. [Press fitting

Press fittings arrived later in HVAC&R due to the higher working pressures of the equipment, but uptake is increasing. Image courtesy of RLS.



systems are now supplied] to more than 29 countries, including the USA, Canada, Japan, Europe, Australia, and Latin America, [and I have] witnessed leaps and bounds in adoption over the last three to four years.”

With millions of fittings already in the market, Slaughter says, “we are excited for the future of press and continuing providing new technology to an evolving and innovative industry”.