



Braze Free Refrigeration Fittings

We have developed a solution for joining together tube without use of solder/flame for high pressure refrigerant applications.

Our technology is a genuine alternative to brazing without the drawbacks a brazed joint can bring.

We believe the technology is revolutionary, an opportunity to change the market, and not just in North America.

We believe it is perfect for the refrigerant market, but specifically for natural refrigerants.

Whereas a flame free connection is an obvious attraction, the additional benefits of a consistent mechanical connection, free from human error, that can be made in seconds with superior leak rates is unparalleled.

RLS stands for 'Rapid Locking System', the initial project name.

Pioneered using I.P. developed by Marmon Groups (Berkshire Hathaway) Copper Tube Company – Cerro Flow Products.

Spun out into new company - RLS LLC.

We are located in Missouri and not only are the fittings made in Missouri but the copper billets and tube used to make the fittings are located in Missouri.

Project has taken considerable resources and is 5 years in the making.

Product has been installed and in continuous testing since August 2011. Over 25,000 fittings now installed without 1 failure.

#3 Technology Advantage

Braze Free Refrigeration Connections

'Everything leaks' but refrigeration leakage is a well-known global concern.

Supermarkets are known to leak as much as \$20k of refrigerant per year (average supermarket has 750 brazed connections).

Much smaller systems such as home air conditioners also leak at joints.

Additionally oxide in system results in issues for system performance.

Nitrogen purge eliminates contamination but is not always done correctly.



#4 Performance

Braze Free Refrigeration Connections

Size	Leak Rate
1/4"	4.00E-10
5/16"	6.10E-10
3/8"	1.30E-09
1/2"	5.00E-09
5/8"	5.40E-09
3/4"	5.20E-09
7/8"	5.40E-09
1-1/8"	3.00E-10

Certified by EWI, 30+ fittings of each size. The above table is the worst performing of each of size. Samples subjected to 3 million vibration cycles prior to testing.

The maximum leak rate detected was 1.30E-09 std.cc/sec, which has a Freon equivalent of .000204 grams/year or 7.223x10⁻⁶ ounces/year. Approximately 1,900 times tighter than F Gas Rule definition of "hermetically sealed".

#5 Performance

Braze Free Refrigeration Connections

Size	Burst Pressure Psi
1/4"	6300
5/16"	5600
3/8"	4700
1/2"	3800
5/8"	3600
3/4"	3400
7/8"	3250
1 1/8"	3000



All of our fittings are much stronger than ACR refrigeration tube of the same size.

#6

Third Party Validation

Braze Free Refrigeration Connections

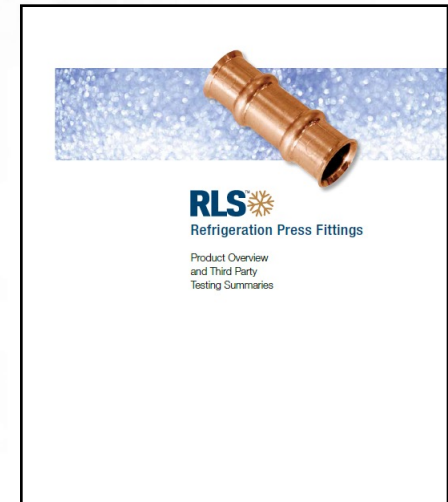
Extensive testing has been carried out by Creative Thermal Solutions.

Testing includes 5000 cycles of freeze-thaw, combined pressure temperature of 8,000 cycles from 90 C to 10 C and 3 million cycles of vibration fatigue.

All fittings passed and leak free.

In addition we have had extensive corrosion testing undertaken using dissimilar metals.

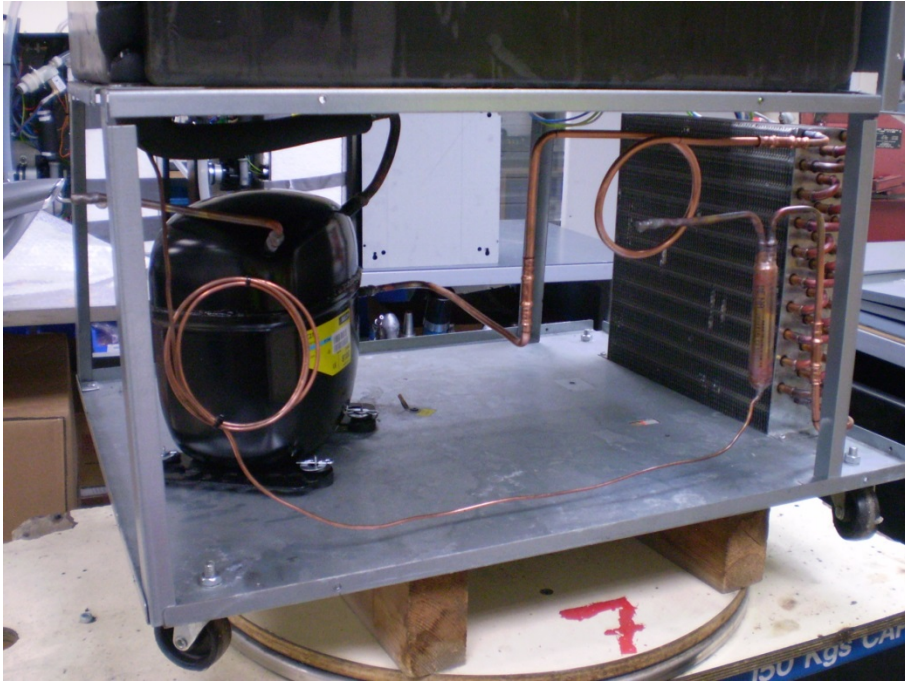
Testing and results available on our website.



#7

Product in Use

Braze Free Refrigeration Connections



Manufacturer in Mexico



Manufacturer in USA

Both are moving towards natural refrigerants in 2016

#8

Product in Use

Braze Free Refrigeration Connections



Supermarket in NE USA.

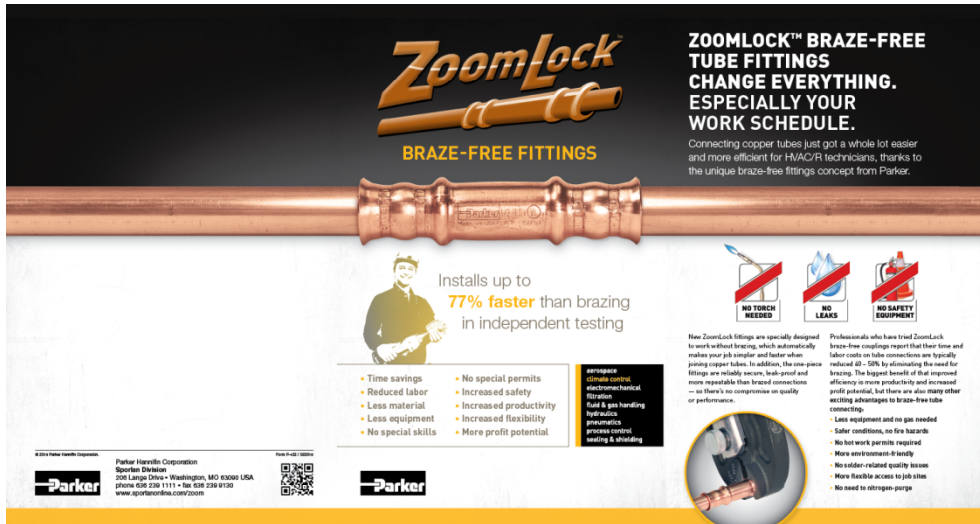
412 Braze Free Connections

#9 Future plans

Product Information

Product being marketed in wholesale/contractor channel by Parker Sporlan.

Brand name Zoomlock.



ZoomLock™ BRAZE-FREE FITTINGS

ZOOMLOCK™ BRAZE-FREE TUBE FITTINGS CHANGE EVERYTHING. ESPECIALLY YOUR WORK SCHEDULE.

Connecting copper tubes just got a whole lot easier and more efficient for HVAC/R technicians, thanks to the unique braze-free fittings concept from Parker.

Installs up to **77% faster** than brazing in independent testing

- Time savings
- Reduced labor
- Less material
- No special skills
- No special permits
- Increased safety
- Increased productivity
- Increased flexibility
- More profit potential

NO TORCH NEEDED

NO LEAKS

NO SAFETY EQUIPMENT

Professional who have tried ZoomLock braze-free couplings report that their time and labor costs on tube connections are typically reduced 40-50% by eliminating the need for brazing. The biggest benefit of this improved efficiency is more productivity and increased profit potential, but there are also many other exciting advantages to braze-free tube connecting.

- Less equipment and no gas needed
- Safe conditions, no fire hazards
- No hot work permits required
- More environment-friendly
- No solder-related quality issues
- More flexible access to job site
- No need to nitrogen-purge

accept
 clean, correct
 electromechanical
 fitting
 fluid & gas handling
 technical
 pneumatics
 pressure control
 sealing & shielding

Parker

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IMAGINE LIFE WITHOUT BRAZING.

Parker

To learn more, visit Booth #222 at the 2015 AHR Expo in Chicago
 ENGINEERING YOUR SUCCESS.

Currently developing products 'stubbed out' with RLS ends – valves, filter driers, sight glasses etc.

Development of new sku's

Introduction of aluminum, stainless and copper cryogenic version of the product.

All 3 products currently in testing.



Stainless version well suited to Co2 applications (burst pressures over 6000psi).

Product currently only available in North America. We will bring to South America and Europe in 2016.



AMERICA **ATMO**
sphere

business case

natural refrigerants

25 & 26 June - Atlanta, Georgia

More information:
www.rlspressfittings.com