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ZoomLock™

BRAZE-FREE FITTINGS

ZoomLock™ Braze-Free Fittings

Catalog K-1, Engineering Submittal, August 2015



ENGINEERING YOUR SUCCESS.

ZoomLock Braze-Free Fittings

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⚠ WARNING – USER RESPONSIBILITY

Failure or improper selection or improper use of the products described herein or related items can cause death, personal injury and property damage.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

OFFER OF SALE

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the detailed "Offer of Sale" available at www.parker.com.



ZoomLock™

BRAZE-FREE FITTINGS

ZoomLock™ fittings are specially designed to work without brazing, which automatically makes your job simpler and faster when joining copper tubes. In addition, the one-piece fittings are reliably secure, leak-proof and more repeatable than brazed connections — so there's no compromise on quality or performance. Professionals who have tried ZoomLock braze-free

couplings report that their time and labor costs on tube connections are typically reduced 40 – 60% on average by eliminating the need for brazing. The biggest benefit of that improved efficiency is more productivity and increased profit potential, but there are also many other exciting advantages to braze-free tube connecting.

The ZoomLock Advantage

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



ZoomLock Braze-Free Fittings



Applications

- High Pressure HVAC/R

Product Parameters

- **Continuous Operating Temperature (COT):**
250°F / 121°C
- **O-Ring Temperature Rating:**
-40°F to +300°F
-40°C to +148.9°C
- **Maximum Rated Pressure (MRP):**
700 psi / 48 bar
- **Maximum Burst Pressure:**
3000 psi / 207 bar+
- **Vacuum Pressure Capability:**
20 Microns
- **External Leak Rate:**
<0.1 Ounces of Helium per Year at Operating Pressure Range
- **Vibration Resistance:**
Conforms to UL109
- **Size Availability (Inches):**
1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 7/8, 1-1/8

Compatibility

- **Approved Oils:**
Mineral Oil, POE, PVE, PAG
- **Approved Tubing Materials:**
Copper to Copper Connections
- **Approved Copper Tubing Type:**
Annealed Copper Tubing
Type ACR, M, L, K* Hard Copper
**Type K Copper works on all sizes except 1-1/8"*

Fitting Materials

- **Fitting Body:**
Refrigerant Grade Copper, per ASTM-B280
- **O-Ring:**
HNBR

Approved Refrigerants

- 1234yf
- 1234ze
- 125
- 32
- 134a
- 143A
- 404A
- 407A
- 407C
- 407F
- 410A
- 438A
- 447A
- 448A
- 449A
- 450A
- 452A
- 507
- 513A



Agency Approvals and Certifications

- UL 207, SA#33958, SDTW(7)
- ICC-ES, PMG-1296
 - 2015 IMC (International Mechanical Code)
 - 2015 IRC (International Residential Code)
 - 2012 UMC (Uniform Mechanical Code)

Fitting Warranty

- 12 months from date of install. Read page 18 for more details.

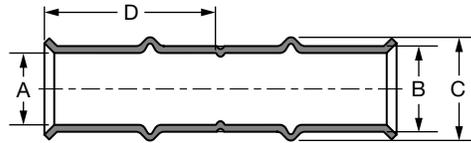


ZoomLock Braze-Free Fittings

Couplings



Dimensions

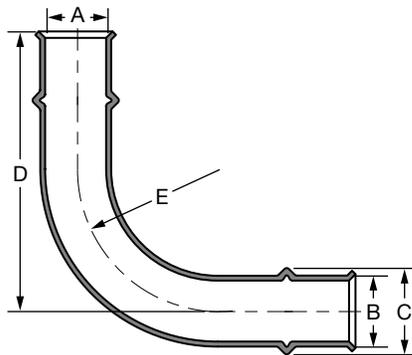


| Size | Part Number | Description | Dimensions | | | | | | | |
|-------|-------------|--------------|------------|------|-------|------|-------|------|------|------|
| | | | A | | B | | C | | D | |
| | | | inch | mm | inch | mm | inch | mm | inch | mm |
| 1/4 | 770500 | PZK-C4-HNBR | 0.260 | 6.6 | 0.340 | 8.6 | 0.453 | 11.5 | 0.95 | 24.1 |
| 5/16 | 770501 | PZK-C5-HNBR | 0.323 | 8.2 | 0.403 | 10.2 | 0.515 | 13.1 | 0.93 | 23.6 |
| 3/8 | 770502 | PZK-C6-HNBR | 0.385 | 9.8 | 0.465 | 11.8 | 0.588 | 14.9 | 0.98 | 24.9 |
| 1/2 | 770503 | PZK-C8-HNBR | 0.510 | 13.0 | 0.590 | 15.0 | 0.734 | 18.6 | 1.25 | 31.8 |
| 5/8 | 770504 | PZK-C10-HNBR | 0.635 | 16.1 | 0.735 | 18.7 | 0.886 | 22.5 | 1.24 | 31.5 |
| 3/4 | 770505 | PZK-C12-HNBR | 0.760 | 19.3 | 0.880 | 22.4 | 1.069 | 27.2 | 1.29 | 32.8 |
| 7/8 | 770506 | PZK-C14-HNBR | 0.885 | 22.5 | 1.015 | 25.8 | 1.188 | 30.2 | 1.31 | 33.3 |
| 1-1/8 | 770507 | PZK-C18-HNBR | 1.135 | 28.8 | 1.285 | 32.6 | 1.443 | 36.7 | 1.29 | 32.8 |

Elbows



Dimensions



| Size | Part Number | Description | Dimensions | | | | | | | | | | | |
|-------|-------------|----------------|------------|------|------|------|------|------|------|-------|----------|----|------|------|
| | | | A | | B | | C | | D | | E (Ref.) | | F | |
| | | | inch | cm | inch | cm | inch | cm | inch | cm | inch | cm | inch | cm |
| 1/4 | 770600 | PZK-90E4-HNBR | 0.26 | 6.6 | 0.34 | 8.6 | 0.45 | 11.5 | 2.01 | 51.1 | 0.50 | 13 | 1.53 | 38.9 |
| 5/16 | 770601 | PZK-90E5-HNBR | 0.32 | 8.2 | 0.40 | 10.2 | 0.52 | 13.1 | 2.13 | 54.1 | 0.60 | 15 | 1.53 | 38.9 |
| 3/8 | 770602 | PZK-90E6-HNBR | 0.39 | 9.8 | 0.47 | 11.8 | 0.59 | 14.9 | 2.27 | 57.7 | 0.65 | 17 | 1.62 | 41.1 |
| 1/2 | 770603 | PZK-90E8-HNBR | 0.51 | 13.0 | 0.59 | 15.0 | 0.73 | 18.6 | 2.88 | 73.2 | 0.90 | 23 | 1.97 | 50.0 |
| 5/8 | 770604 | PZK-90E10-HNBR | 0.64 | 16.1 | 0.74 | 18.7 | 0.89 | 22.5 | 3.21 | 81.4 | 1.13 | 29 | 2.08 | 52.8 |
| 3/4 | 770605 | PZK-90E12-HNBR | 0.76 | 19.3 | 0.88 | 22.4 | 1.07 | 27.2 | 3.47 | 88.0 | 1.50 | 38 | 1.97 | 50.0 |
| 7/8 | 770606 | PZK-90E14-HNBR | 0.89 | 22.5 | 1.02 | 25.8 | 1.19 | 30.2 | 3.75 | 95.3 | 2.25 | 57 | 1.51 | 38.4 |
| 1-1/8 | 770607 | PZK-90E18-HNBR | 1.14 | 28.8 | 1.29 | 32.6 | 1.44 | 36.7 | 4.29 | 108.8 | 2.85 | 72 | 1.43 | 36.3 |

Tool Kits



0 Jaw Tool Kit

Includes the crimping tool and the tool kit contents, listed below.

- **Description:** PZK-TK0
- **Part Number:** 770000



3 Jaw Tool Kit

Includes the crimping tool, 3 jaws, and tool kit contents, listed below.

- **Description:** PZK-TK3
- **Part Number:** 770001
- **Jaw Sizes:** 3/8", 1/2", 7/8"



5 Jaw Tool Kit

Includes the crimping tool, 5 jaws and tool kit contents, listed below.

- **Description:** PZK-TK5
- **Part Number:** 770002
- **Jaw Sizes:** 3/8", 1/2", 5/8", 7/8", 1-1/8"

Tool Kit Contents:

- Crimping Tool
- Tubing Cutter
- Deburring Tool
- RLS Crimp Gauge
- Stainless Steel Brush
- Abrasive Pad
- Permanent Marker
- Battery Charger
- (2) Lithium-Ion Rechargeable Batteries



Crimping Tool

- **Available in Tool Kits:**
PZK-TK0, Part Number 770000
PZK-TK3, Part Number 770001
PZK-TK5, Part Number 770002
- **Not Sold Separately**

- Short pressing cycle, 5-7 seconds
- Compact design and 350° jaw rotation allows technician to install in tight spaces
- Lightweight design increases productivity
- Tool service indicated via imbedded LEDs, illuminates at 10,000 cycles
- Automatic piston return
- Safety feature that allows crimp cycle to be interrupted
 - Feature allows manual release of piston, if needed
- High-quality, powerful Makita Li-Ion technology for lasting, battery-powered pressing
 - 100-150 Crimps per Charge
 - Extremely short charging time of just 15 minutes (1.5 Ah)
 - Makita i-Press batteries and chargers available worldwide.

Tool Specifications

- **Crimping Force:**
Linear thrust of approx. 15 kN
- **Number of Crimps:**
1.5 Ah approx. 150 (for NS20)
- **Battery Capacity:**
High-power Makita 1.5 Ah Li-Ion battery
- **Charging Time:**
1.5 Ah 15 min.
- **Weight including Battery:**
Without jaw 1.7 kg
Including jaw 2.3 kg
- **Dimensions:**
377 x 75 x 116 mm
- **Revolving/Rotatable:**
Approx. 350° rotating pressing jaw holder
- **Tool Warranty:**
24 months from date of purchase

Replacement Parts and Accessories



Pressing Jaws

Pressing jaws, ranging in sizes from 1/4" through 1-1/8", may be purchased individually.

| Size (Inches) | Part Number | Description |
|---------------|-------------|-------------|
| 1/4 | 770200 | PZK-J4 |
| 5/16 | 770201 | PZK-J5 |
| 3/8 | 770202 | PZK-J6 |
| 1/2 | 770203 | PZK-J8 |
| 5/8 | 770204 | PZK-J10 |
| 3/4 | 770205 | PZK-J12 |
| 7/8 | 770206 | PZK-J14 |
| 1-1/8 | 770207 | PZK-J18 |



Pressing Jaw Kit

8 piece jaw kit in rigid plastic carrying case. Includes jaw sizes 1/4" through 1-1/8".

- **Description:** J4-J18
- **Part Number:** 770208



Jaw Carrying Case

Empty rigid carrying case with firm foam insert. Holds up to 8 jaws.

- **Description:** Jaw Carrying Case Only
- **Part Number:** 770209



Tubing Cutter

ZoomLock approved tubing cutter.

- **Description:** Tubing Cutter
- **Part Number:** 770006



Deburring Tool

ZoomLock approved deburring tool.

- **Description:** Tube Deburring Tool
- **Part Number:** 770007



RLS Crimp Gauge

Confirms the measurement of the finished crimp band diameter.

- **Description:** PZK-GNG1
- **Part Number:** 770005



Battery Charger

230V AC battery charger for 18V Li-ion batteries.

- **Description:** DC18RC
- **Part Number:** 770003



Rechargeable Battery

High performance, 1.5 Ah, 18V Li-ion battery with high capacity and extremely short charging time of just 15 minutes.

- **Description:** BL1815
- **Part Number:** 770004

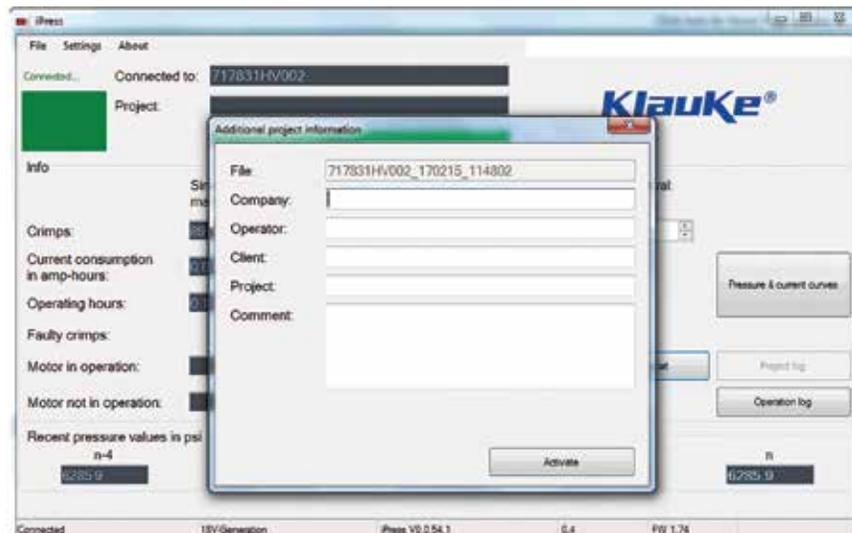
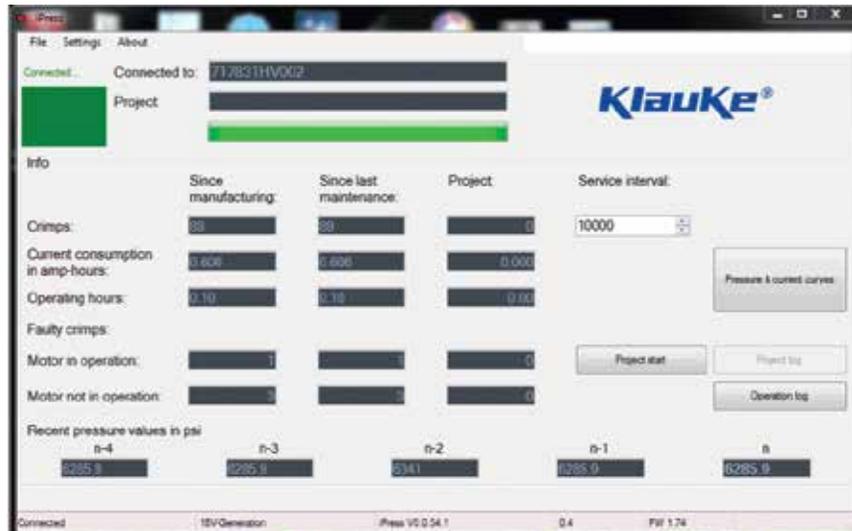
Replacement Parts and Accessories



Diagnostic Tool

Adaptor tool for crimping tool diagnostics. Easily connect to PC via USB-Interface. Provides statistical evaluation of average crimping process of tool. Free downloading of Software "iPress" via www.klauke.com.

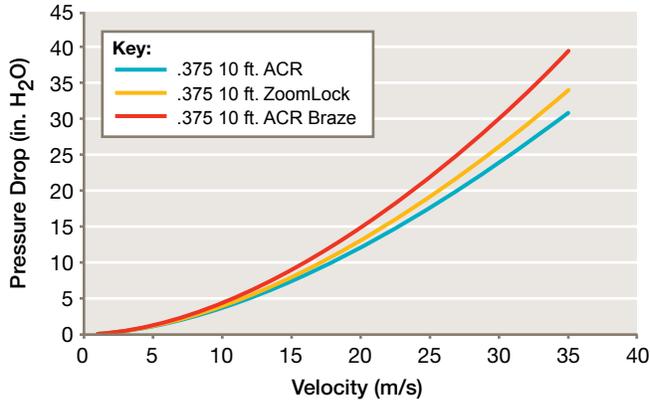
- **Description:** PGA1
- **Part Number:** 770008



Performance Data

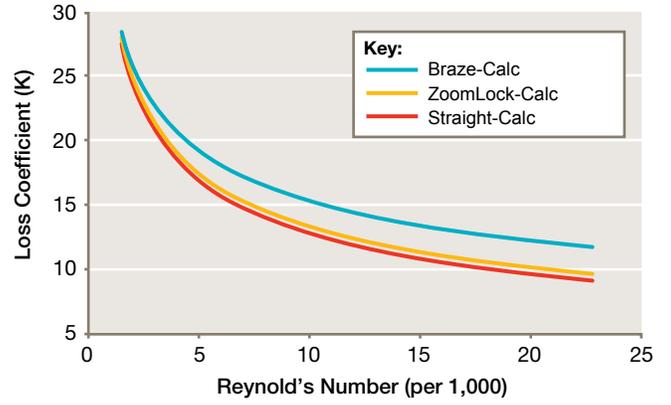
ACR Pressure Drop (10 ft. long)

3/8" ACR Tube Pressure Drop vs. Velocity

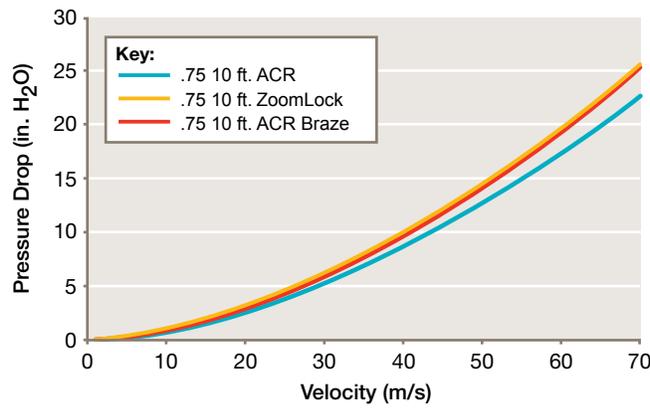


ACR Loss Coefficient

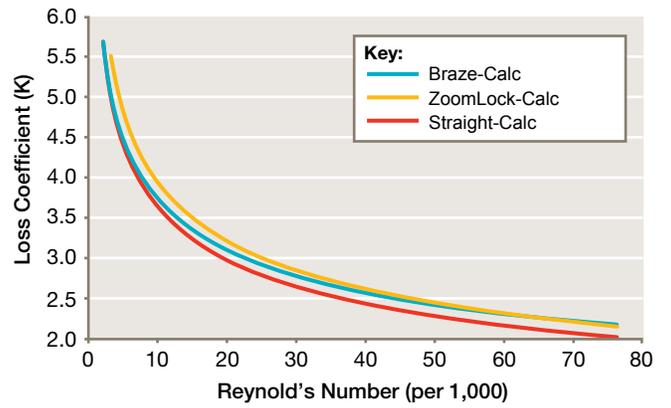
3/8" ACR Tube Loss Coefficient vs. Reynolds Number



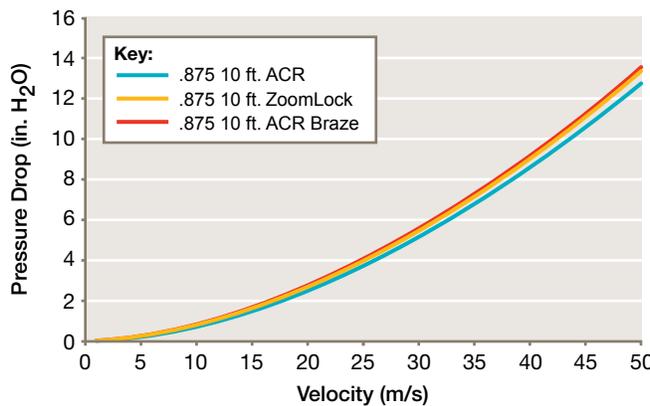
3/4" ACR Tube Pressure Drop vs. Velocity



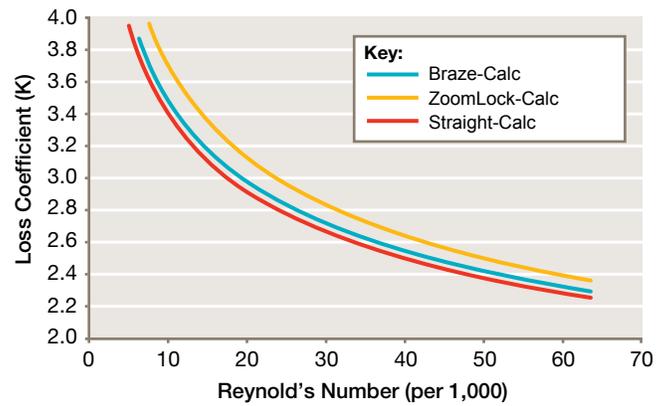
3/4" ACR Tube Loss Coefficient vs. Reynolds Number



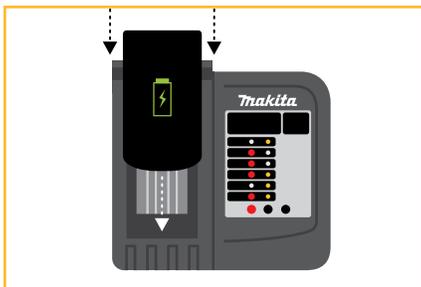
7/8" ACR Tube Pressure Drop vs. Velocity



7/8" ACR Tube Loss Coefficient vs. Reynolds Number



Installation Instructions



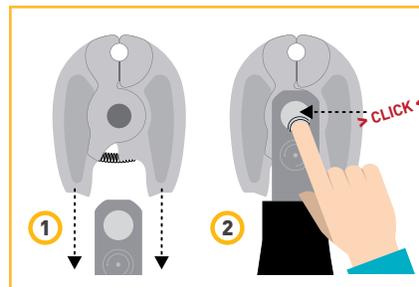
STEP 1

Slide battery into charger. Plug charger into a power source. Check to see that the charging light is on. When red light turns off and green light turns on, battery is fully charged ~ 20 minutes.



STEP 2

Press the locking pin, then rotate 45° to release.



STEP 3

Slide jaws over Crimping Tool head, then depress locking pin until it clicks.



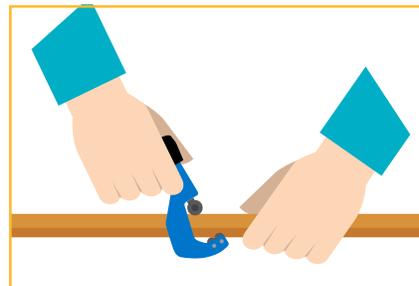
STEP 4

Slide charged battery into base of Crimping Tool.



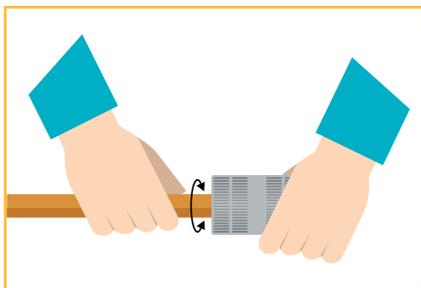
STEP 5

Press and hold the trigger on Crimping Tool to calibrate. **Calibration is recommended daily, prior to use.**



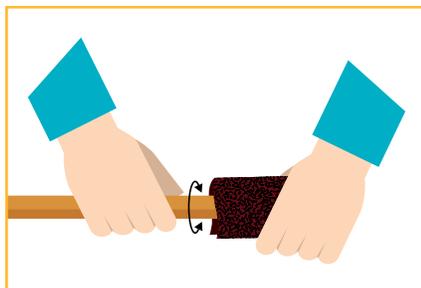
STEP 6

Cut the copper tube using the **supplied** tube cutter. Do **NOT** use a hacksaw or reciprocating saw as this creates a rough surface that may damage the o-ring.



STEP 7

Use the **supplied** deburring tool to remove any residual burrs from the outside and inside of the copper tube.



STEP 8

Use a heavy duty scouring pad to clean the ends of the copper tubes to be joined. Tube ends should be free and clear of oxidation, dirt or debris.

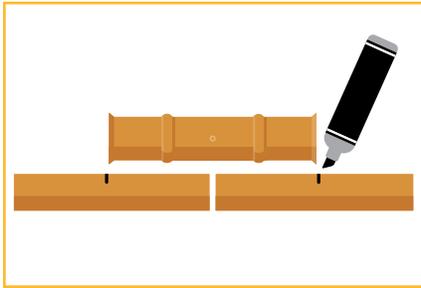


STEP 9

Inspect the copper tube for deep scratches within the o-ring sealing area that may provide a leak path for refrigerant. If scratches are present, cut off the affected area or sand thoroughly to remove.

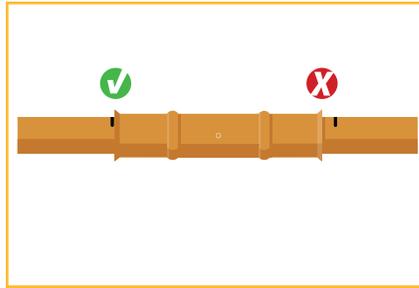
WARNING: COPPER TUBE ENDS SHOULD BE INSPECTED AND ANY SHARP EDGES SHOULD BE ADDRESSED. SHARP EDGES MAY CAUSE DAMAGE TO THE O-RING.

Installation Instructions



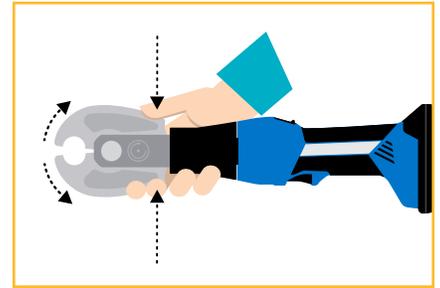
STEP 10

Using the dimple as a reference point for the center of the fitting, mark the tubing with a permanent marker to indicate proper insertion depth on every tube.



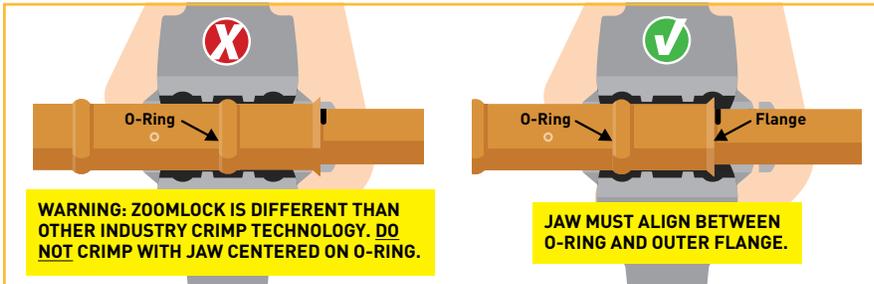
STEP 11

Push the fitting onto the tube. A reference dimple in the fitting helps assure insertion depth and secure fit.



STEP 12

Open the jaws of the ZoomLock Crimping Tool.



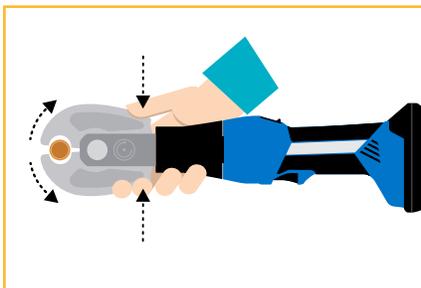
STEP 13

Properly place the crimping jaws onto the fitting. Grooves in the jaws make it easy to align. See illustration at right for proper crimping alignment.



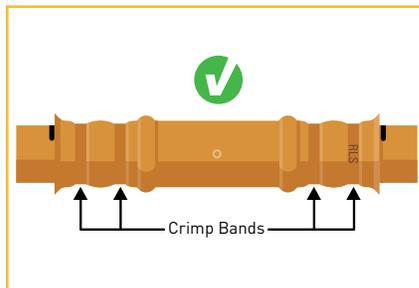
STEP 14

Press and hold the trigger on the ZoomLock Crimping Tool to begin the crimping process. Continue to hold the trigger until the ZoomLock Crimping Tool completes its cycle.



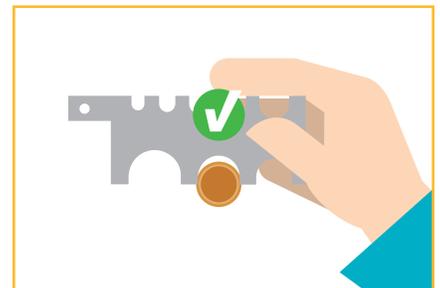
STEP 15

Open the jaws of the ZoomLock Crimping Tool and remove from the fitting. If the jaws do not open, the crimping cycle was not completed. For manual override instructions, see ZoomLock FAQs, Form P-457.



STEP 16

A special "RLS" mark will be displayed on the tube to let you know the connection is crimped properly.



STEP 17

The supplied RLS Crimp Gauge will confirm the measurement of the finished crimp band diameter. See crimp band locations noted in Step 16. It may be necessary to rotate the gauge in order to not interfere with the copper tube flashing left from the crimping process.

ICC-ES Evaluation Report



Effective Date: January 2015
Revision Date: February 13, 2015

PMG-1296

CSI: DIVISION: 23 00 00—HEATING, VENTILATING AND AIR CONDITIONING (HVAC)
Section: 23 20 00—HVAC Pipe and Fittings

Product certification system:

The ICC-ES product certification system includes testing samples taken from the market or supplier's stock, or a combination of both, to verify compliance with applicable codes and standards. The system also involves factory inspections, and assessment and surveillance of the supplier's quality system.

Products: Refrigeration Tubing Connectors

Listee: RLS, LLC
101 S. Douglas Street
Shelbina, MO 63468
www.rlspressfittings.com

Additional Listee:

Parker Sporlan
206 Lange Drive
Washington, MO 63090
www.parker.com

Compliance with the following codes:

2015, 2012, 2009 and 2006 *International Mechanical Code*® (IMC)
2015, 2012, 2009 and 2006 *International Residential Code*® (IRC)
2012, 2009 and 2006 *Uniform Mechanical Code*® (UMC)*

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Compliance with the following standards:

UL 207 (Edition 8), Standard for Refrigerant-Containing Components and Accessories, Nonelectrical

Identification:

The refrigerant tubing connectors shall be legibly and permanently marked with the manufacturer's name, trade name, trademark, or identifying symbol or other descriptive marking by which the organization responsible for the product may be identified.

The shipping carton, a separate instruction sheet included with the shipping carton or a tag attached to the component shall include a distinctive model, part number, or type designation for the connector and include information for each refrigerant type for which the connector is intended and the ICC-ES PMG listing mark.

Installation:

The refrigerant tubing connectors must be installed in accordance with the manufacturer's published installation instructions, the applicable codes and this listing.

Mechanical joints shall not be used on annealed temper copper tube in sizes larger than 7/8-inch (22.2 mm) OD size per IMC and 3/4" of an inch nominal size per UMC.

Models:

The refrigerant tubing connectors are intended for connection of copper, aluminum, titanium and other types of tubing approved by the manufacturer. The connection is accomplished by

ICC-ES Evaluation Report

compressing (solder-free) the fitting to a pipe. The refrigerant tubing connectors are only suitable for type A1 refrigerants (R-134a, R-402, R-404A, R-407A, R-410A).

Serial Model Name: RLS™ Cu

| Type of Connector | Sizes (Inches) |
|-------------------|---|
| Couplings | 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 7/8, 1-1/8 |
| Slip Couplings | 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 7/8, 1-1/8 |
| Long Radius 90° | 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 7/8, 1-1/8 |
| Stubs | 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 7/8, 1-1/8 |
| Reducers | 1/4 x 5/16, 5/16 x 3/8, 3/8 x 1/2, 1/2 x 5/8, 5/8 x 3/4, 3/4 x 7/8, 7/8 x 1-1/8 |
| Tees | 1/2, 3/4, 7/8, 1-1/8 |
| Reducing Tees | 5/8 x 5/8 x 7/8, 3/4 x 3/4 x 7/8, 7/8 x 7/8 x 1-1/8 |
| Cap | 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 7/8, 1-1/8 |
| Return Bend | 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 7/8, 1-1/8 |

Ratings:

| Sizes | Design Pressure, psig | Maximum Abnormal Pressure, psi | Continuous Operating Temperature |
|------------|-----------------------|--------------------------------|----------------------------------|
| 1/4" RLS | 700 | 700 | 250°F (121°C) |
| 5/16" RLS | 700 | 700 | 250°F (121°C) |
| 3/8" RLS | 700 | 700 | 250°F (121°C) |
| 1/2" RLS | 700 | 700 | 250°F (121°C) |
| 3/4" RLS | 700 | 700 | 250°F (121°C) |
| 5/8" RLS | 700 | 700 | 250°F (121°C) |
| 7/8" RLS | 700 | 700 | 250°F (121°C) |
| 1-1/8" RLS | 700 | 700 | 250°F (121°C) |

Conditions of Listing:

1. The refrigerant tubing connectors must be used with only the following refrigerants (R-134a, R-402, R-404A, R-407A, R-410A).
2. Mechanical joints shall not be used on annealed temper copper tube in sizes larger than 7/8 inch (22.2 mm) OD size per IMC and 3/4 inch (19 mm) nominal size per UMC.
3. The installation must be pressure-tested for leaks in the presence of the code official of the code official's designated representative.
4. When installation is in fire-resistance-rated assemblies, evidence must be provided to the code official of compliance with International Building Code® (IBC) Section 713 (penetrations), *Uniform Building Code* (UBC) Section 709 (walls and partitions) or UBC Section 710 (floor/ceiling or roof/ceiling), as applicable.
5. The connectors must be used as a source of electrical ground.
6. When the system is embedded in concrete, tubing must be covered a minimum of 3/4 inch (19.1 mm) and installation must comply with IBC Section 1906.3 or UBC Section 1906.3, as applicable.
7. The refrigerant tubing connectors is manufactured by Cerro Flow Products, LLC in Shelbina, Missouri, under a quality control program with surveillance inspectors annually by ICC-ES.

Helium Leak Test Report



1250 Arthur E Adams Dr., Columbus, OH 43221

LAB SERVICES

Helium Leak Test Report

page 1 of 2

Customer: Marmon Refrigeration Technologies

Project No.: 12866CSL-01

Equipment: Veeco MS-40

Date Reported: January 10, 2013

Project Engineer: Jim Busch

Principal Tech: Barb Christel

Scope: To test and report the leak rate of RLS press connections.

Background: Marmon Refrigeration Technologies (MRT) submitted RLS™ press connection samples for helium leak testing. Six (6) different RLS™ sizes were chosen to connect commercially available ACR tubing (see Table 1). Thirty (30) union connections were chosen as a sample lot with two (2) connections per fitting. Each sample connected two pieces of tubing approximately nine (9) inches long. One of the tubes was brazed shut at one end and the other tube was reduced to a ¼" tube stub.

Table 1. Tube Diameters Tested

| Tube O.D. (in) | # of Samples | Total # of Tested Connections | Notes |
|-------------------|-----------------|----------------------------------|---|
| 0.250 | 30 | 60 | Samples were made from commercially available ACR tubing (soft) |
| 0.313 | 30 | 60 | |
| 0.375 | 30 | 60 | |
| 0.750 | 30 | 60 | |
| 0.875 | 30 | 60 | |
| 1.125 | 30 | 60 | |

EWI Leak Testing Approach: Prior to testing each lot of samples, the Veeco MS-40 helium leak tester was calibrated. After calibration, a solid ¼" dowel was tested to verify the integrity of the seals on the helium leak test fixture.

The ¼" tube stub was wiped down with methanol and connected to the leak detector via a Swagelok ¼" Ultra-Torr vacuum fitting (see Figure 1). Each sample was pumped down to a level of approximately 500 millitorr prior to applying helium gas near the RLS™ crimp joint (at atmospheric pressure). The helium leak rate was measured and recorded for each of the sixty (60) connections in a thirty (30) piece sample lot.

Helium Leak Test Report



1250 Arthur E Adams Dr., Columbus, OH 43221

LAB SERVICES

Helium Leak Test Report

page 2 of 2

Customer: Marmon Refrigeration Technologies

Project No.: 12866CSL-01

Equipment: Veeco MS-40

Date Reported: January 10, 2013

Project Engineer: Jim Busch

Principal Tech: Barb Christel



Figure 1. Test Set-up

Results: The maximum leak rate of all connections is summarized in Table 2. The maximum leak rate detected was 5.40E-09 std.cc/sec.

Table 2. Maximum Leak Rate per Lot

| Tube O.D. (in) | Maximum Helium Leak std.cc/sec |
|-------------------|-----------------------------------|
| 0.250 | 4.00E-10 |
| 0.313 | 6.10E-10 |
| 0.375 | 1.30E-09 |
| 0.750 | 5.20E-09 |
| 0.875 | 5.40E-09 |
| 1.125 | 3.00E-10 |

Reported by: Brad Nagy

Signature: Brad Nagy

Title: Manager, Weld & Test Labs

Frequently Asked Questions

1. How many crimps can you complete on a complete battery charge?

On average you can achieve 100-150 crimps per charge depending on the size fittings being crimped. Each kit comes with 2 Makita Lithium-ion batteries and a rapid charge charging system. To prevent any downtime, it is recommended that you have both batteries charged before going to the jobsite and to have one charging while the other is in use.



2. Can you use ZoomLock to crimp to aluminum, steel, or stainless steel?

No, ZoomLock is specifically designed for copper to copper connections. Connecting to dissimilar metals can cause formicary corrosion issues that could cause a failure.

3. What material is the o-ring made of?

The o-ring is a highly engineered HNBR Parker o-ring that has been used in HVAC applications by OEMs and suppliers for many years with no issues.

4. What is the expected life of the o-ring in the system?

The expected life of the o-ring that stays within the product specifications for temperature and pressure should be 30 years.

5. Are there any shelf life concerns?

No, the shelf life of the product is estimated at or above 30 years.

6. Is there a concern about ice building up and then thawing under fitting in a horizontal or vertical configuration?

No, ZoomLock has been thoroughly tested in freeze/thaw applications with over 10,000 cycles completed in both vertical and horizontal configurations with no leakage concerns.

7. If a fitting does leak, can you braze the fitting in rather than cutting out the fitting and having to make up for lost pipe?

If you find a fitting that has a refrigerant leak, try re-crimping the connection first. If that does not work, the fitting must be cut out and replaced. Trying to braze the fitting will very likely melt the o-ring material and thus introduce contaminants into the system that could cause other system issues.

8. Are there any concerns with corrosion due to coastal applications, cleaning agents, or off-gassing of produce/vegetables?

No, ZoomLock has gone through a battery of corrosion testing, completing over 2,000 hours of salt spray testing without failure, which proves the resilience of the product.

9. How do you slide insulation over these fittings (the flare will grab insulation).

If the flare of the fitting tends to be a problem, you can smooth the transition over the fitting by adding duct tape around the flared edge of the fitting to the tube.

10. How do you know when the tool needs to be serviced?

The tool has a red LED on the back of the tool that will blink for 20 seconds after a crimp. When this occurs, take the tool back to an authorized dealer to have the tool analyzed. They will be able to verify if the tool needs to be sent in for service.

11. What is the expected life of the jaws?

Each jaw has an expected life of 10,000 to 12,000 crimps.

12. How do you know when the jaw needs to be replaced?

You will know when the jaw needs to be replaced when the contact point between the upper and lower jaw starts to open up/widen. A good indication of failure is when the crimp gauge no longer engages.

13. Do you have a solution for crimping onto flared tubing like that coming out of the condenser and evaporator on residential units?

No, we do not have a specific product designed to crimp over the flared tubing. However, if there is at least 2 inches of straight copper tubing after the flared end and is accessible with the jaws, we suggest that you cut the flared end off and crimp directly to the tube.

Frequently Asked Questions

14. Is ZoomLock approved by state and city building codes?

ZoomLock has been approved by UL-207, ASHRAE 15, International Code Council –Evaluation Service (ICC-ES), International Mechanical Code (IMC), Universal Mechanical Code (UMC), and International Residential Code (IRC). These approvals are all that is needed in most areas. Please contact your local building inspector with questions prior to install.

15. How much tolerance can the ZoomLock handle on the pipe being crimped?

We know that not all copper tubing is the same, but we have tested ZoomLock with most copper tube manufacturers with no issues. The tolerance for each tube to ensure a good leak-free joint is $+.002/-0.007$.

16. Does the o-ring compensate for imperfections in the piping to make a tight seal?

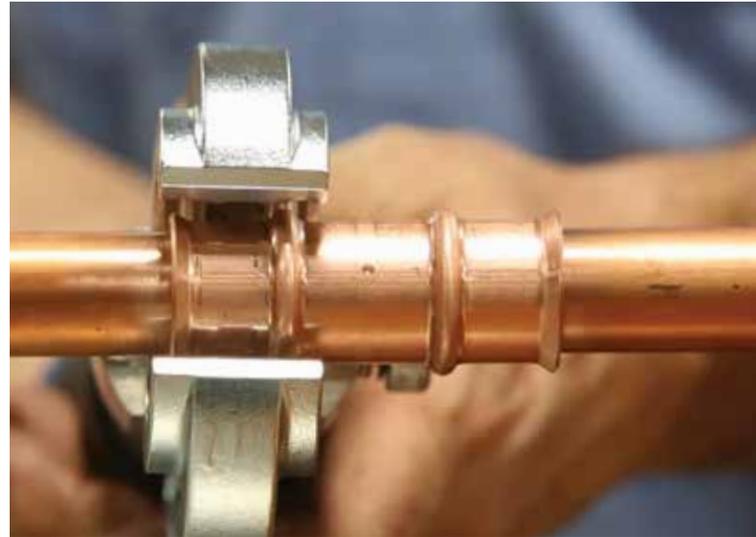
Yes, the o-ring does compensate for small/minor scratches on the surface of the tube; however, the tubing needs to be inspected prior to use per ASTM B280 and the Copper Tube Handbook published by the Copper Development Association (CDA) specifications. Imperfections in and adjacent to the crimp area could inhibit the joint integrity. These imperfections may include surface scratches, incise marks, and tubing out of round.

17. The product specifications state that the application temperature limits are -40°F to +300°F / -40°C to -150°C. What happens if we go beyond that limit?

If the application that the fitting is being used in goes beyond the specified limits of the o-ring (-40°F to +300°F / -40°C to -150°C) then there will be an increased likelihood that a leak can occur.

18. Can I use ZoomLock in a transportation application where fitting vibration is high?

Yes, ZoomLock has gone through extensive vibration testing and results are actually better than that of a braze joint. Please review the vibration testing procedure and conclusion for more information.



19. Are the ZoomLock jaws compatible with any commercially available crimping tool?

Yes, the ZoomLock jaws are compatible with the Nibco (Model PC-20M), the Rothenberger (Model 16001), Heatlink (Model 11500), and Uponor (Model D6261632).

20. Are the jaws compatible with the Ridgid/Propress tool?

No, the jaws are not compatible with the Ridgid/Propress tool at this time.

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15. **Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive

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16. **Waiver and Severability.** Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.
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18. **Governing Law.** This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.
19. **Indemnity for Infringement of Intellectual Property Rights.** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.
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