



A CSW Industrials Company

PRO-Fit™ Quick Connect

Push-to-Connect Refrigerant Fittings for Residential Application



Push-to-connect refrigerant fittings

Flame-free fittings for connecting refrigerant lines



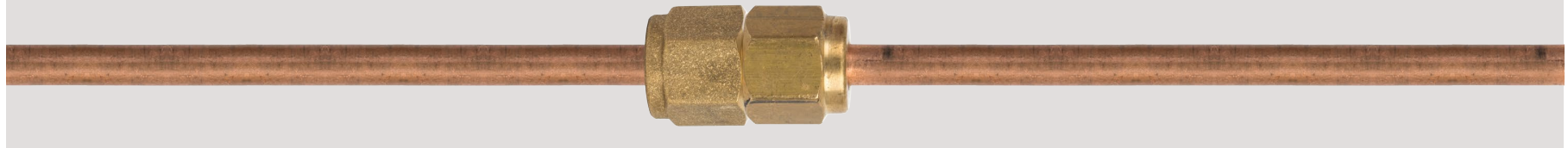
Challenges of refrigerant line connections

Poor flaring can lead to refrigerant leaks.

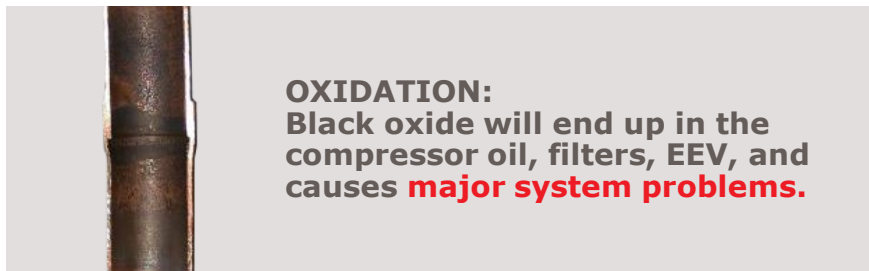


Incorrect torque can result in refrigerant leaks.

Flare connections can leak refrigerant over time due to **over or under tightening the flare nut**.



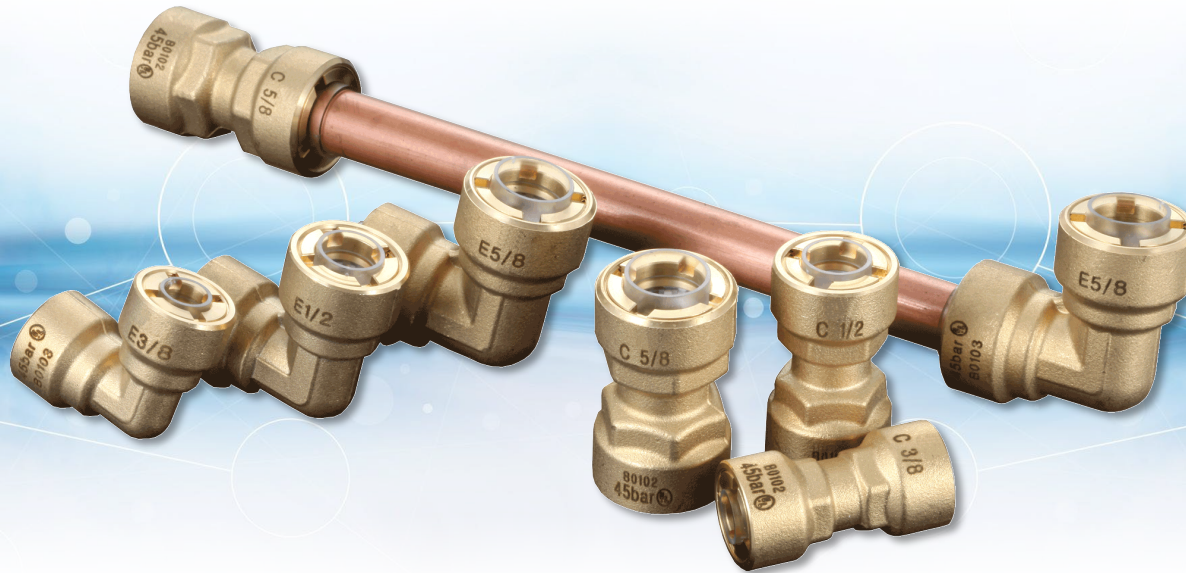
Improper brazing can lead to oxidation and damage to the entire system.



Why PRO-Fit™ Quick Connect?



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Quick Install

Flame-free
Push-in connections
Quick release removal

Durable

Brass body
Leak-resistant
Tested and UL verified

Versatile

Complete system
Copper and coated
aluminum linesets

Mini-splits and
unitary systems

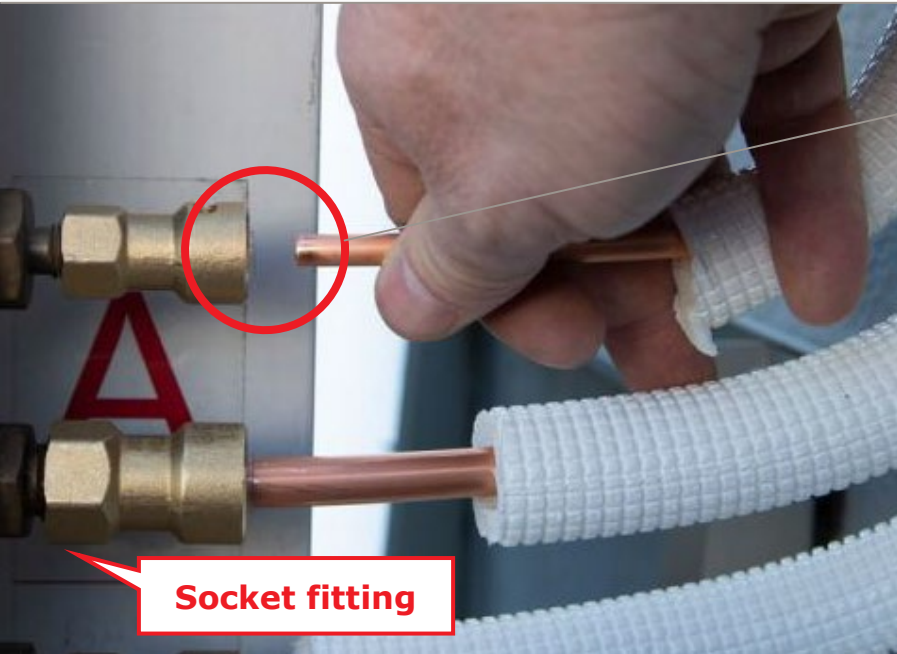
Flame-free connections

No flaring or brazing needed



Sight window

Visually verify pipe seating



Push-in connection

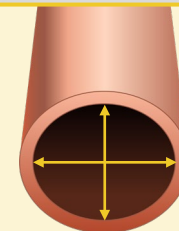
- ✓ Cut copper
- ✓ Deburr inside pipe edge, tap out shavings
- ✓ Ream inside and outside of pipe
- ✓ Clean pipe surface to remove oxidation/oils
- ✓ Measure and mark insertion depth
- ✓ Push pipe into fitting until flush with marking
- ✓ Pressure test system



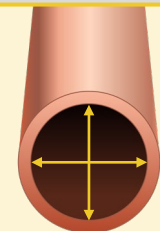
When preparing the connection, **ensure the copper tubing is round.**

Oval piping **will not create a solid seal with the double o-ring** which can result in failure.

If the tubing has "ovalized", **use a swaging tool to shape the copper** round in preparation for connection.



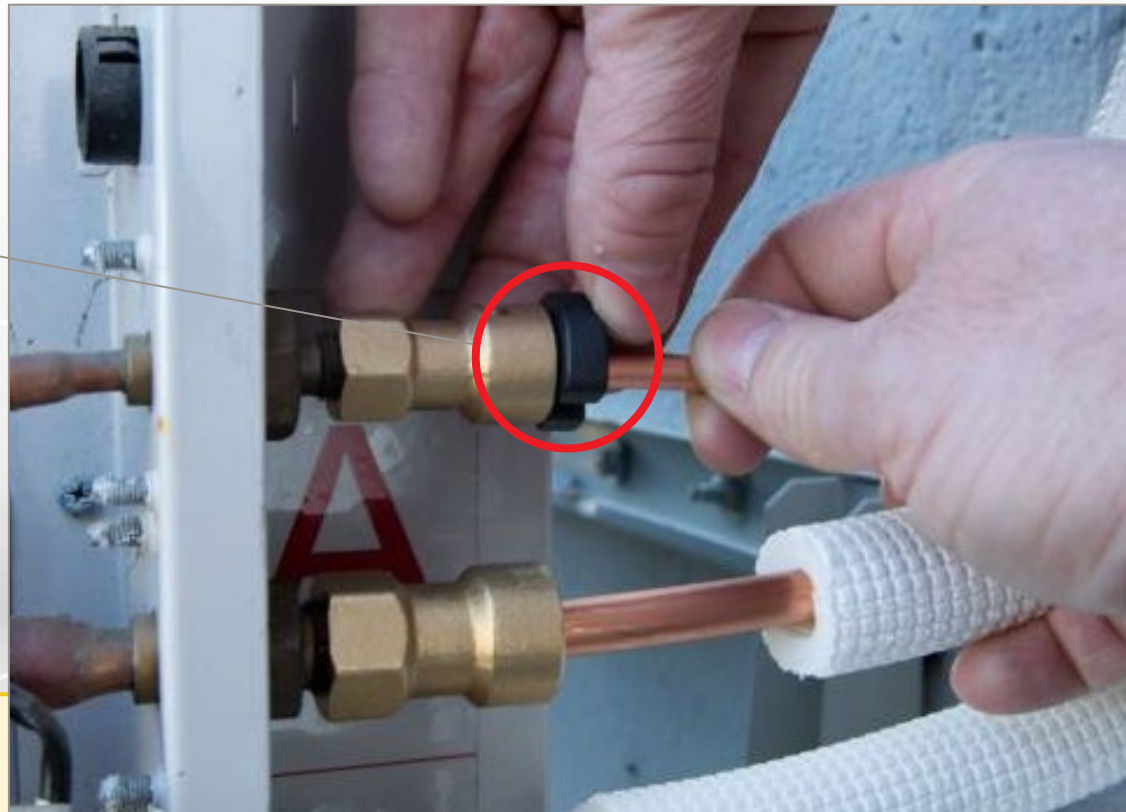
Oval



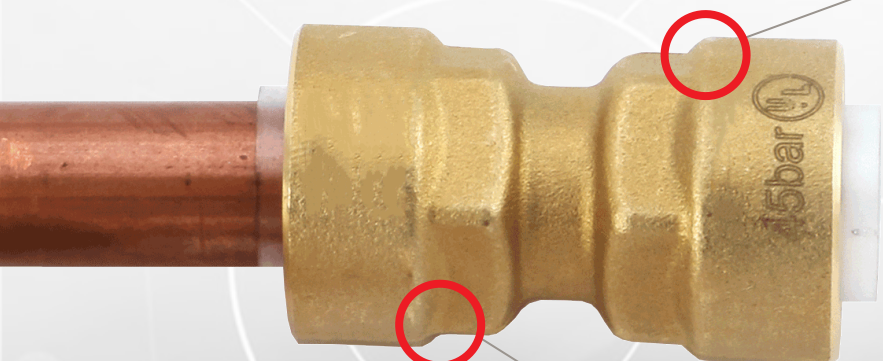
Round

Easy release removal

Place the release tool against the fitting and pull the piping from the fitting.



Ensure the refrigerant has been pumped from the system **before disconnecting linesets.**



Brass body

Robust, durable, reliable



Double o-ring sealing

High performance chloroprene elastomer is resistant to leaks and refrigerant.

Thoroughly tested. UL verified and certified.

UL157

O-ring
chemical
compatibility
test

UL207

Strength test
Pressure test
Ammonia
air stress
cracking test

UL250

Accelerated
aging test –
electrical
heaters

UL1963

Vibration test
Pull test



External Testing

Fatigue testing

Chemical compatibility test

Salt spray test

Internal Testing

Long term leak test

Vibration test

Test on A/C unit

Tube bend

Burst pressure

Tensile strength

Reusability

Helium leak test

ICC Evaluation Service (ICC-ES PMG) certified

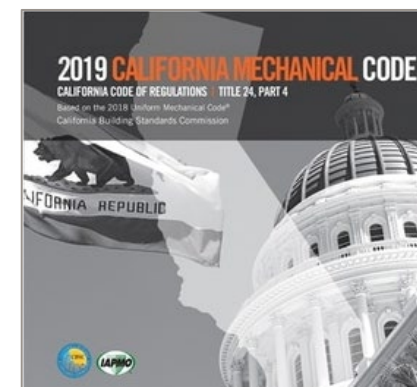
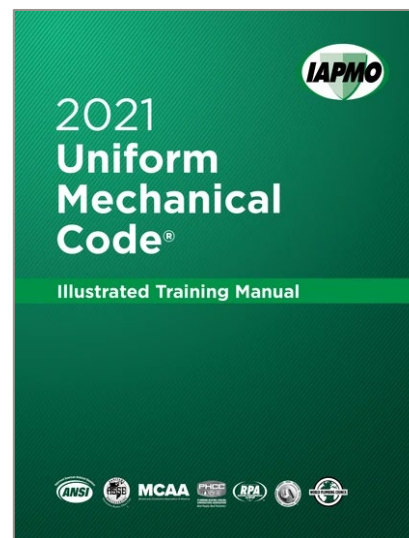
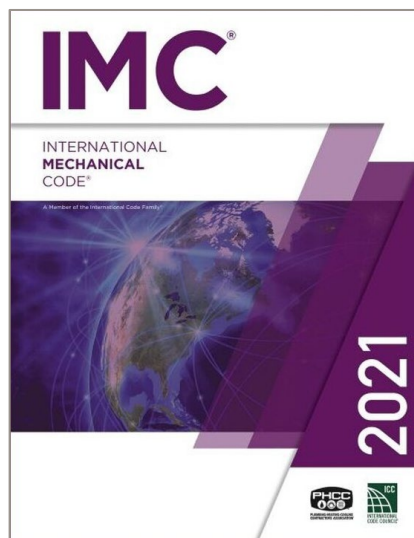
Compliance with the following codes:

2021, 2018, 2015, and 2012 **International Mechanical Code®** (IMC)

2021, 2018, 2015, and 2012 **International Residential Code®** (IRC)

2021, 2018, 2015, and 2012 **Uniform Mechanical Code®** (UMC)*

2019, 2016, 2013, and 2010 **California Mechanical Code®** (CMC)



*Copyrighted publication of the International Association of Plumbing and Mechanical Officials.

UL157 O-ring chemical compatibility test



O-ring evaluated did not shrink by more than 1% or swell by more than 25% when exposed to R-410A and POE lubricant for 14 days at a temperature of 130°C. This pass/fail criteria was set to comply with the criteria stated in UL157.

Dimensional change

Elastomer (mm)	Pre			Post		
	Thickness	ID	OD	Thickness	ID	OD
Average	3.01	12.24	17.76	3.04	12.07	18.72
Dimensional change				+1%	-1%	+5%

Volume change

Elastomer (g)	Pre dry mass M1	Pre wet mass M2	Post dry mass M3	Post wet mass M4	Volume change
Test sample average	0.5069	0.1581	0.5615	0.1552	+16%

Mass change

Elastomer (g)	Pre mass	Post mass	Mass change
Test sample average	0.5069	0.5615	+11%

Strength and fatigue testing of refrigerant pipe couplers

Test description	Standard	Section	Result
Strength test	UL 207	13	Passed
Fatigue test	UL 207	14	Passed

Meets requirements contained within UL 207

DEI Issued: 2009/04/20 Ed: 8 Rev: 2014/06/27 Refrigerant-Containing Components and Accessories, Nonelectrical

UL1963 vibration test

Test conditions

- Maintaining internal 50psi pressure
- Amplitude 3.18mm, frequency of vibration 17Hz
- X, Y, and Z axes are vibrated for 16 hours each (48 hours total)

Tested fittings

- 1/4", 3/8", 1/2", 5/8" union fittings (2 of each)
- 1/4", 3/8", 1/2", 5/8" elbow fittings (2 of each)

Criteria for judgement

- No leaks



Type	Result
1/4" Union 1/4" Elbow	Passed
3/8" Union 3/8" Elbow	Passed
1/2" Union 1/2" Elbow	Passed
5/8" Union 5/8" Elbow	Passed

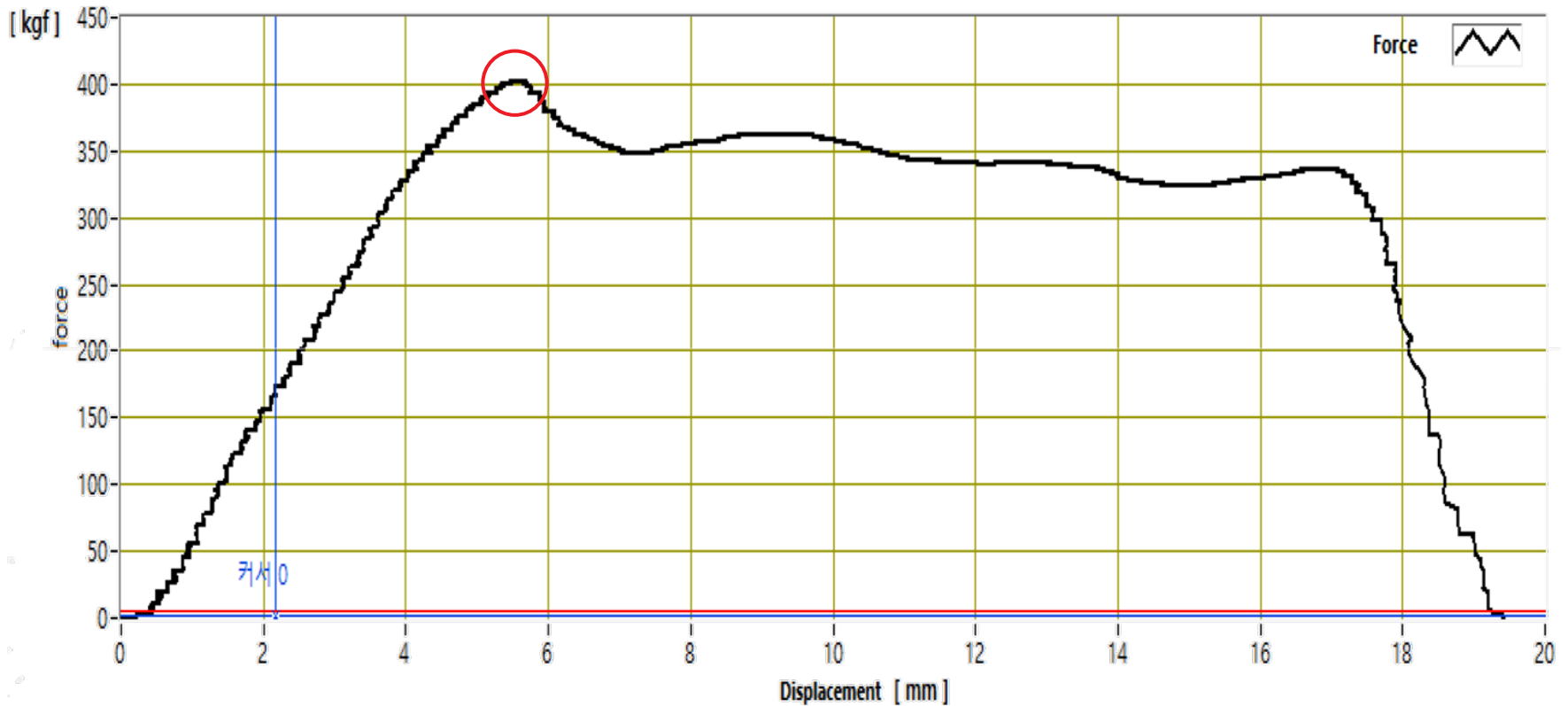
Union and elbow pass all standard examination.

**Test results:
No leakage
(No pressure reduction)**

UL1963 tensile test (tube pull out test)

Test item	Pull-out start	Pull-out point	UL pull test standard
5/8" union	340kgf (4,835.9psi)	401.2kgf (5703.6psi)	54.4kgf (773.8psi)

Over 7 times higher tensile strength than UL standard!



Leakage rate



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Test type	Test contents	Test standard	Result
Thermal shock test	R-143A refrigerant -26°C/4hr → 49°C/4hr; 1 cycle 5 cycle	1.5g/yr ↓	Passed

Installation test

Sample	Description	Refrigerant	Leakage (g/day)	Leakage (g/year)
1	1/2" elbow	R-410A	0.00014	0.051
2	1/2" elbow	R-410A	ND*	ND*
3	1/2" elbow	R-410A	ND*	ND*
4	1/2" elbow	R-410A	ND*	ND*
5	1/2" elbow	R-448A	0.00030	0.110
6	1/2" elbow	R-448A	ND*	ND*
7	1/2" elbow	R-448A	0.00002	0.007
8	1/2" elbow	R-448A	ND*	ND*
9	1/4" elbow	R-410A	ND*	ND*
10	1/4" elbow	R-410A	ND*	ND*
11	1/4" elbow	R-410A	ND*	ND*
12	1/4" elbow	R-410A	ND*	ND*
13	1/4" elbow	R-448A	ND*	ND*
14	1/4" elbow	R-448A	ND*	ND*
15	1/4" elbow	R-448A	ND*	ND*
16	1/4" elbow	R-448A	ND*	ND*
17	1/4" union	R-410A	ND*	ND*
18	1/4" union	R-410A	0.00080	0.291
19	1/4" union	R-410A	0.00004	0.014
20	1/4" union	R-410A	ND*	ND*

Reinstallation test

Sample	Description	Refrigerant	Leakage (g/day)	Leakage (g/year)
1	1/2" elbow	R-410A	0.00095	0.347
2	1/2" elbow	R-410A	0.00066	0.240
3	1/2" elbow	R-410A	0.00072	0.263
4	1/2" elbow	R-410A	0.00072	0.263
5	1/2" elbow	R-448A	0.00064	0.233
6	1/2" elbow	R-448A	0.00058	0.211
7	1/2" elbow	R-448A	0.00056	0.205
8	1/2" elbow	R-448A	0.00168	0.614
9	1/4" elbow	R-410A	0.00034	0.123
10	1/4" elbow	R-410A	0.00042	0.154
11	1/4" elbow	R-410A	0.00031	0.112
12	1/4" elbow	R-410A	ND*	ND*
13	1/4" elbow	R-448A	ND*	ND*
14	1/4" elbow	R-448A	0.00089	0.313
15	1/4" elbow	R-448A	ND*	ND*
16	1/4" elbow	R-448A	ND*	ND*
17	1/4" union	R-410A	0.00059	0.216
18	1/4" union	R-410A	ND*	ND*
19	1/4" union	R-410A	0.00033	0.119
20	1/4" union	R-410A	0.00066	0.242

NOTE: "Intertek" test report; *Non-detect. Detection limit estimated 0.004g/yr for R-410A, 0.007g/yr for R-448A.

Thirteen (13) types of reliability test



Test type	Test contents	Test standard	Result
Leakage	Applying test pressure of 4.2 Mpa	No leakage allowed	✓
Hydraulic	Applying 1.5 times of water pressure (6.3 Mpa/63 bar) higher than design pressure for 1 min.	No leakage on spindle on/off allowed	✓
Burst pressure	Applying 3 times of water pressure (12.6 Mpa/126 bar) higher than design pressure	No leakage and destroy allowed	✓
Flow	Pressure drop 0.01MPa, amount of fluid	Satisfied with KS	✓
Impact resistance	Dropping specimen of pipe connection in X, Y, Z direction 1 meter off concrete floor	No deformation, destroy and leakage allowed	✓
Durability	Doing Stem On-Off 10 times, 4.2MPa leakage test	No leakage	✓
Ammonia	Cleaning after exposure to ammonia for two hours	No crack	✓
Salt spray	Following KS D 9502, testing union by salt water spray tester for 48 hours.	No defective allowed (crack, swelling)	✓
High temp. resistance	Injecting mixed fluid of R410A and refrigeration oil in the weight ratio of 7 to 3. Setting environment as 4.2 MPa (42 Bar) at 120 ° C and to be seen for 72 hours	No leakage allowed	✓
Low temp. resistance	Injecting mixed fluid of R410A and refrigeration oil in the weight ratio of 7 to 3. Setting environment as 4.2 MPa (42 Bar) at -30 ° C and to be seen for 72 hours	No leakage allowed	✓
Thermal shock test	Injecting mixed fluid of R410A and refrigeration oil in the weight ratio of 7 to 3. To be followed in order of 120°C/1hr, -35°C/1hr (42kg/cm ²) 1Cycle. 40Cycle required	No leakage allowed	✓
Vibration test	At 2.2G Acceleration, Vibration width 1mm, 3 exes, each 4 hours repeat	No leakage allowed	✓
Environmental test (UV)	UV 8,760Hours (365days) Exposed	No leakage allowed	✓

Complete system with a wide selection of sizes and fittings



Union



90°
elbow



Reducer



90° elbow
reducer



Socket



Service
valve

	Union	90° elbow	Reducer	90° elbow reducer	Socket	Service valve
1/4"	●	●	●	●	●	●
3/8"	●	●	●	●	●	●
1/2"	●	●	●	●	●	●
5/8"	●	●	●	●	●	●
3/4"	●	●			TBD	TBD
7/8"	●	●			TBD	TBD

NOTE: Other fittings are available, if there is a need for a customer, we can look at bringing in a smaller quantity.

Compatible with mini-split ductless and unitary ducted residential systems



Residential and Commercial applications are covered by warranty.

Allows HCFC and HFC refrigerants

R134a, R404A, R290, R500, R407A, R600a, R22, R410A, R407C, R32



Maximum rated pressure: 653psi (45bar) ~ 870psi (60bar)



Works with copper and coated aluminum* linesets



***To avoid galvanic corrosion, do not use uncoated aluminum linesets directly with fittings.**

ZoomLock/Conex comparison



Installation tools	None needed	Tool required
Seal	Double o-ring seal	Metal on metal; one o-ring seal
Application	Residential (single family)	Commercial
Merchandising	Individually merchandised	Boxed
Cost	Higher cost per fitting	Higher total cost with required tool
	 Cost effective, flexible solution for smaller, residential projects.	 Solution for larger, commercial projects.

PRO-Fit™ Quick Connect demo



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Cross-sell products: Support kits



Code	Support kits	Qty
87048	1/4", 3/8", 1/2", 5/8" disconnect clips; 1/4"—5/8" line marking tool	10
87049	3/4" and 7/8" disconnect/line marking tool	10

Model numbers



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Code	Description	Qty
87018	1/4" union	10
87019	3/8" union	10
87020	1/2" union	10
87021	5/8" union	10
87022	3/4" union	10
87023	7/8" union	10
87024	1/4" elbow	10
87025	3/8" elbow	10
87026	1/2" elbow	10
87027	5/8" elbow	10
87028	3/4" elbow	10
87029	7/8" elbow	10
87030	1/4" to 3/8" reducer	10
87031	3/8" to 1/2" reducer	10
87032	1/2" to 5/8" reducer	10

Code	Description	Qty
87033	1/4" to 3/8" elbow reducer	10
87034	3/8" to 1/2" elbow reducer	10
87035	1/2" to 5/8" elbow reducer	10
87036	1/4" socket	10
87037	3/8" socket	10
87038	1/2" socket	10
87039	5/8" socket	10
87042	1/4" valve	5
87043	3/8" valve	5
87044	1/2" valve	5
87045	5/8" valve	5

Applications

- Recommended for single family residences with mini-split ductless and/or unitary ducted systems (AC/R: liquid/suction lines)

Fitting warranty

- 5 year limited warranty. Terms and conditions apply. See warranty for details.

Fitting Materials

- **Fitting body:**
C3771, PC (Polycarbonate)
- **O-ring:** CR (Chloroprene rubber)

Certifications

- **UL 207**
 - Strength and pressure tests: 12 & 13; 04/09; C22.2 No. 140.3; 5.11 & 6.1; 03/15
 - 10-day moist ammonia air stress cracking test: 18A.2; 04/09
- **UL 250**
 - Accelerated aging test – electrical heaters: Section 8.22
- **UL 1963**
 - Vibration test: Section 52.10
 - Pull test: Section 52.11
- **UL 157**
 - Gaskets and seals for refrigerant exposure
- **ICC-ES PMG**
 - ICC Evaluation Service

Parameters

- **Continuous operating temp:** 250°F
- **O-ring temperature rating:**
-40°F to 250°F
- **Maximum rated pressure (MRP):**
653 psi ~ 870psi
- **Max burst pressure:** 2,100psi
- **Vacuum pressure capacity:**
30 Microns
- **Tensile (grip) strength:** 3,911.4psi
- **Vibration resistance rating:**
UL 1963
- **External leak rate:** 0.2 ounces/yr ↓

Approved refrigerants

- R134a, R404A, R290, R500, R407A, R600a, R22, R410A, R407C, R32

Compatibility

- **Tubing tolerance:** ASTM B280, UNI EN 12735
- **Approved tubing materials:**
Copper to copper connection, coated aluminum

Tightening Torque

- **1/4":** 426.7 to 568.9psi
- **3/8":** 426.7 to 568.9psi
- **1/2":** 568.9 to 711.2psi
- **5/8":** 711.2 to 853.4psi
- **Service valve stem release torque:** The pipe should not fall out below 2,275.7psi

Internal testing

- **Fatigue test:** Repeat 250,000 cycles test
- **Hydraulic test:** 979.01psi water pressure, no leakage
- **Hydraulic test service valve:** 903.2psi
- **Leak test:** Air pressure 597.4psi, no leakage
- **Tubing falling test:** The copper tube should not fall out of the fittings below the following psi's:
 - **611.6psi**
1/4" union, 1/4" elbow, 1/4" socket, 1/4" to 3/8" reducers, 3/8" to 1/2" reducers, 1/2" to 5/8" reducers
 - **1,359.8psi**
3/8" union, 3/8" elbow, 3/8" socket
 - **2,425.1psi**
1/2" union, 1/2" elbow, 1/2" socket
 - **3,790.5psi**
5/8" union, 3/4" union, 7/8" union, 5/8" elbow, 3/4" elbow, 7/8" elbow, 5/8" socket



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