

# >B< MaxiPro

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## Fitting System

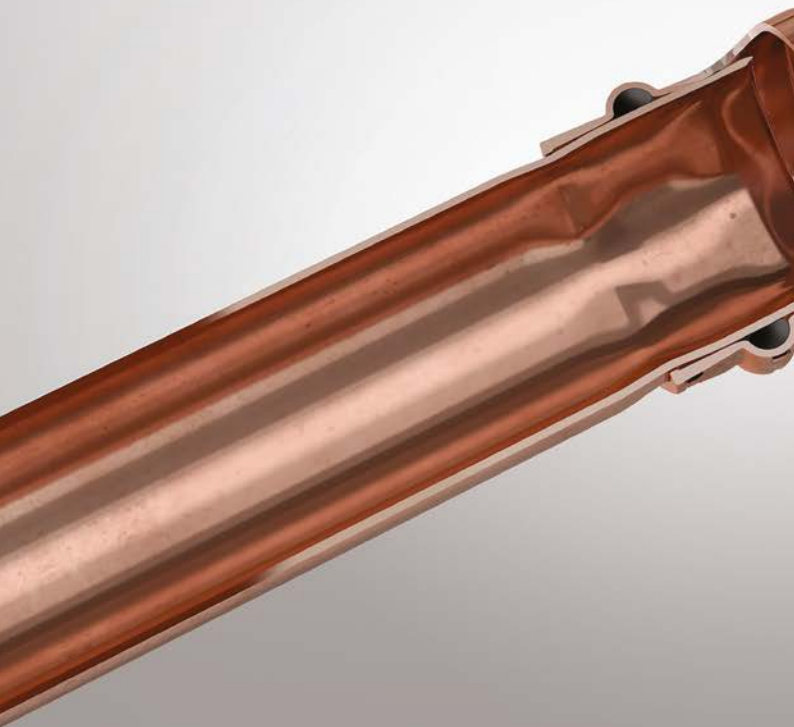
An innovative press system suitable for air conditioning and refrigeration applications.



# >Join the Press Revolution<

## 110 Years of Innovation

Conex Bänninger specialises in providing fittings, valves and accessories across the globe by offering innovative and versatile solutions. Since opening its doors in Giessen, Germany in 1909, Conex Bänninger has produced over 20 billion copper fittings, establishing an unrivalled reputation for outstanding quality, first class customer service and market leading expertise.



A close-up photograph of a copper pipe with a MaxiPro press fitting. The fitting is a clear, ring-like structure that encircles the pipe, creating a secure joint. The copper has a warm, reddish-brown hue and a slightly textured surface. The background is a soft, out-of-focus gradient.

## >B< MaxiPro

A revolutionary press fitting system that provides a secure, permanent and leak-proof joint suitable for both refrigeration and air conditioning applications.

### Fast Facts

- > OVER 20 BILLION FITTINGS SOLD WORLDWIDE SINCE 1909
- > CONEX BÄNNINGER >B< MARK INTRODUCED IN 1920
- > OVER 900 STAFF WORKING ACROSS THE GLOBE
- > CAPACITY TO PRODUCE 500 MILLION PIECES A YEAR

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## 1. Applications

>B< MaxiPro fittings are ideally suited to the following applications:

### REFRIGERATION



### AIR CONDITIONING



# >Key Features<

## Designed for Australia

Developed in partnership with Reece, Conex Bänninger and Rothenberger to meet the specific needs of the Australian market.



## Tool Service Support

To ensure optimal performance, your Rothenberger press tools can be serviced through the Reece Tool Service Department.



## Extensive Testing

>B< Press fittings undergo rigorous internal testing to ensure they meet Australian standards and piping tolerances.



## Training and Certification

Reece supports you with training and certification as well as expert advice whenever you need it.



## Flame Free

Takes away the risk of fire on site and eliminates the need for a hot works permit and heavy equipment.



## No Nitrogen Purge

>B< MaxiPro is a mechanical joint, thus eliminating the need for nitrogen purge during the fitting jointing process.



## Lower Installed Cost

A professional fitting which is quick and simple to install, saving time and money.



## Higher Productivity

Installation can be completed during working hours or public access by a single employee.



### Quality Designed In

Reliable, repeatable, permanent, tamper-proof connections every time.



### High Quality O-ring

>B< MaxiPro refrigeration and air conditioning range uses a high quality HNBR O-ring that forms a secure leak-free joint when pressed.



### Protected O-ring

Lead-in edge design aids installation and helps protect the O-ring from damage or displacement.



### Fitting Identification

>B< MaxiPro fittings for air-conditioning and refrigeration applications are identified with a pink mark on the fitting.



### Electrical Continuity

Maintains earth continuity without the need for additional earth continuity straps.



### Warranty

>B< MaxiPro is covered by a 15 year product warranty.



### Compact Tooling

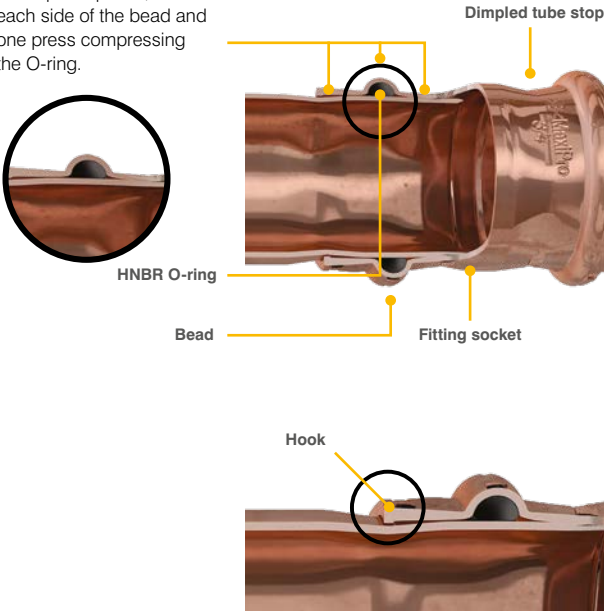
Light compact tooling provides easy access to tightly spaced pipe runs.



### 3. 3-Point Press Technology

The >B< profile has the advantage of two mechanical presses either side of the bead and one hydraulic press crimping the O-ring. This provides a permanent and secure joint. The lead-in edge design aids installation and helps protect the O-ring from damage or displacement.

Three press points, one each side of the bead and one press compressing the O-ring.



On fittings 1/2" and upwards, a hook ensures that the high pressure performance achieved by >B< MaxiPro fittings is maintained.



## 4. Technical Data

Technical Data	
Parameters	Capability
Applications	Air conditioning and refrigeration
Connections	Copper to copper
Approved tube	Copper tube conforming to AS/NZS 1571*
Fitting / Pipe Range	1/4", 3/8", 1/2", 5/8", 3/4", 7/8", 1", 1 1/8", 1 3/8"
Fitting Material	Refrigerant grade copper (UNS C12200 min 99.9% pure)
O-ring	HNBR
Approved oils	POE, PAO, PVE, AB and mineral oil
Maximum operating and abnormal pressure	48 bar / 4800 kPa / 700 psig
Vacuum	200 microns
Leak Rate	ISO5149-2 compliant
Leak Tightness	Helium $\leq 7.5 \times 10^{-7}$ Pa.m <sup>3</sup> /s at +20 °C, 10 bar
O-ring temperature range	-40°C to 140°C
UL listing continuous operating temperature	-40°C to 121°C
Approvals, standards and test compliance	<ul style="list-style-type: none"> <li>• UL listed, refrigerant fitting SA44668.*</li> <li>• UL listed, approved use for field and factory installations.*</li> <li>• UL 109-7 Pull Test, compliant.</li> <li>• UL 109-8 Vibration Test, compliant.</li> <li>• UL 1963-79 Tests of Gaskets and Seals Used in Refrigerant Systems, compliant.</li> <li>• ISO 5149-2, compliant.</li> <li>• ISO 14903 - Tightness test, compliant.</li> <li>• ISO 14903 - Temperature, pressure cycling and vibration test, compliant.</li> <li>• ISO 14903 - Freeze / thaw test, compliant.</li> <li>• ASTM G85, compliant.</li> <li>• AS/NZS 5149.2, compliant.</li> </ul>

\*Please see >B< MaxiPro Tube Compatibility Table on pages 52-53.

## 4. Technical Data

Refrigerant Compatibility			
Refrigerant	GWP*	Safety Group	Compatible
R-125	3500	A1	✓
R-134a	1430	A1	✓
R-404A	3922	A1	✓
R-407A	2107	A1	✓
R-407C	1744	A1	✓
R-407F	1825	A1	✓
R-407H	1495	A1	✓
R-410A	2088	A1	✓
R-417A	2346	A1	✓
R-421A	2631	A1	✓
R-422B	2526	A1	✓
R-422D	2729	A1	✓
R-424A	2440	A1	✓
R-427A	2138	A1	✓
R-434A	3245	A1	✓
R-437A	1805	A1	✓
R-438A	2264	A1	✓
R-448A	1386	A1	✓
R-449A	1397	A1	✓
R-450A	601	A1	✓
R-452A	2140	A1	✓
R-452C	2220	A1	✓
R-453A	1765	A1	✓
R-456A	1430	A1	✓
R-507A	3985	A1	✓
R-513	573	A1	✓
R-513A	631	A1	✓
R-513B	596	A1	✓
R-515B	299	A1	✓
R-718	0	A1	✓

Refrigerant Compatibility			
Refrigerant	GWP*	Safety Group	Compatible
R1234yf	4	A2L**	✓
R1234ze	7	A2L**	✓
R-32	675	A2L**	✓
R-444A	92	A2L**	✓
R-447A	582	A2L**	✓
R-447B	740	A2L**	✓
R-452B	698	A2L**	✓
R-454A	239	A2L**	✓
R-454B	466	A2L**	✓
R-454C	148	A2L**	✓
R-455A	146	A2L**	✓
R-457A	139	A2L**	✓
R-459A	460	A2L**	✓
R-290	3	A3**	✓
R-600A	3	A3**	✓
Medium			Compatible
HYCOOL 20			✓
Ethylene Glycol			✓

**Note:** >B< MaxiPro fittings are **NOT** suitable for R-717, R-723, R-764, R-744, R-22 refrigerants.

\* GWP: Global Warning Potential [C02 = 1,0]

\*\* When using refrigerants classified A2L (lower flammability), A2 (flammable) and A3 (higher flammability) additional/specific standards, local rules and regulations, codes of practice and by-laws may be applicable.



## 5. Quality Assurance

Conex Bänninger is an ISO 9001 quality assured company. We are committed to providing quality products and support to our customers.

## 6. Standards and Approvals

>B< MaxiPro fittings are:

- UL 207 certified, component number SA44668.
- UL 109-7 Pull Test, compliant.
- UL 109-8 Vibration Test compliant.
- UL 1963-79 Tests of Gaskets and Seals used in Refrigerant Systems, compliant.
- ISO 14903 - Tightness test, compliant.
- ISO 14903 - Temperature, pressure cycling and vibration test, compliant.
- ISO 14903 - Freeze / thaw test, compliant.
- ISO 5149-2, compliant.
- ASTM G85, compliant.
- AS/NZS 5149.2, compliant.

CERTIFICATE OF COMPLIANCE	
<b>Certificate Number</b>	20160817-SA44668
<b>Report Reference</b>	SA44668-20160808
<b>Issue Date</b>	2016-AUGUST-17
<b>Issued to:</b>	Conex Universal Limited Global House 95 Vantage Point, The Pensnett Estate Kingswinford DY6 7FT UNITED KINGDOM
<b>This is to certify that representative samples of</b>	COMPONENT - REFRIGERATION, FITTINGS >B< MaxiPro, MPA Series
<b>Standard(s) for Safety:</b>	See Addendum
<b>Additional Information:</b>	Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate. See the UL Online Certifications Directory at <a href="http://www.ul.com/database">www.ul.com/database</a> for additional information
Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.	
The UL Recognized Component Mark generally consists of the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory. As a supplementary means of identifying products that have been produced under UL's Component Recognition Program, UL's Recognized Component Mark: <b>NA</b> , may be used in conjunction with the required Recognized Marks. The Recognized Component Mark is required when specified in the UL Directory preceding the recognitions or under "Markings" for the individual recognitions.	
Recognized components are incomplete in certain constructional features or restricted in performance capabilities and are intended for use as components of complete equipment submitted for investigation rather than for direct separate installation in the field. The final acceptance of the component is dependent upon its installation and use in complete equipment submitted to UL LLC.	
Look for the UL Certification Mark on the product.	
<b>Certificate Number</b>	20160817-SA44668
<b>Report Reference</b>	SA44668-20160808
<b>Issue Date</b>	2016-AUGUST-17
This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.	
<b>Standard(s) for Safety:</b> UL 207, Refrigerant-Containing Components and Accessories, Nonelectrical UL 109, Tube Fittings for Flammable and Combustible Fluids, Refrigeration Service, and Marine Use CSA C22.2 No. 140.3-15, Refrigerant-containing Components for use in Electrical Equipment	
 Bruce Maheshwari, Director, American Certification Program UL LLC	
	
<small>Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at (800)368-7000/ul.com.</small>	

## 7. Trademarks

>B< MaxiPro is a registered trademark in Australia and in numerous territories worldwide.

## 8. Warranty

When installed, used and serviced in accordance with >B< MaxiPro installation guidelines a 15 year warranty covers against faults caused by defective manufacture of the fittings. It does not cover faults arising from incorrect installation, use or servicing.

The >B< MaxiPro warranty only covers systems assembled from copper tube complying with the standards and dimensions set out in the >B< MaxiPro Tube Compatibility Table, see pages 52-53.

All >B< MaxiPro fittings must be installed by a tradesperson licensed to work on systems containing refrigerant.

## 9. Size Availability

>B< MaxiPro is available in the following sizes 1/4", 3/8", 1/2", 5/8", 3/4", 7/8", 1", 1 1/8", 1 3/8". For more information, see range details.

## 10. Fitting Materials and Finish

>B< MaxiPro is manufactured from copper (UNS C12200 min 99.9% pure).

## 11. Fitting Storage

>B< MaxiPro fittings should be stored and kept in their sealed bags to protect them from contamination.

The HNBR O-rings should be protected from light sources, in particular, direct sunlight or intense artificial light having a high ultra-violet content.

As ozone is especially harmful and damaging to rubber, storage rooms should not contain any equipment that is capable of generating ozone, such as mercury vapour lamps or high-voltage electrical equipment giving rise to electric sparks or silent electrical discharges.

Combustion gases and organic vapours should be excluded from storage rooms, as they may give rise to ozone via photochemical processes. Precautions should also be taken to protect stored products from all sources of ionising radiation.

## 12. Marking and Cleanliness

Each fitting is marked with >B< MaxiPro, size and 48 BAR (on a pink background) and are cleaned, bagged and labelled to fully comply with the cleanliness requirements of AS/NZS 1571.





# >The Range<







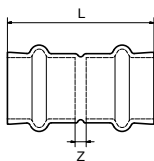
## Union

Product Code	Size
406027	1/4"
406028	3/8"
406029	1/2"
406030	5/8"
406031	3/4"
406032	7/8"
406033	1"
406034	1 1/8"
406080	1 3/8"

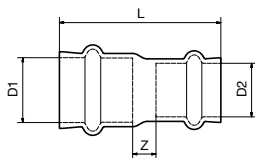


## Reducer

Product Code	Size (D1 x D2)
406089	3/8" x 1/4"
406073	1/2" x 1/4"
405995	1/2" x 3/8"
405996	5/8" x 3/8"
405997	5/8" x 1/2"
405998	3/4" x 3/8"
405999	3/4" x 1/2"
406000	3/4" x 5/8"
406001	7/8" x 1/2"
406002	7/8" x 5/8"
406003	7/8" x 3/4"
406071	1" x 3/4"
406088	1" x 7/8"
406004	1 1/8" x 5/8"
406005	1 1/8" x 3/4"
406006	1 1/8" x 7/8"
406072	1 1/8" x 1"
406009	1 3/8" x 1 1/8"
406008	1 3/8" x 7/8"



L	Z
39.0	3.0
39.0	3.0
40.0	5.0
45.0	3.0
45.5	1.5
56.5	8.5
49.0	2.0
57.0	6.0
71.0	3.0



L	Z
42	6
44	8.5
42.5	7.0
47.5	8.5
45.5	7.0
51.0	11.0
46.0	6.5
52.5	9.5
52.5	11.0
52.5	7.5
52.5	6.5
55	9.5
55	9.5
55.0	8.5
57.5	10.0
58.0	8.5
56	7
72.0	12.5
67.0	13



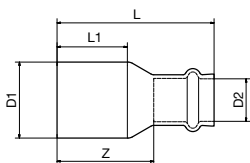
## Bush

Product Code	Size (D1 x D2)
406037	3/8" X 1/4"
406011	1/2" X 3/8"
406012	5/8" X 3/8"
406013	5/8" X 1/2"
406014	3/4" X 1/2"
406015	3/4" X 5/8"
406016	7/8" X 1/2"
406017	7/8" X 5/8"
406018	7/8" X 3/4"
406019	1 1/8" X 1/2"
406020	1 1/8" X 5/8"
406021	1 1/8" X 3/4"
406022	1 1/8" X 7/8"
406025	1 3/8" X 1 1/8"

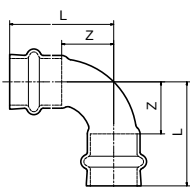


## Elbow - 90 Degree

Product Code	Size
405955	1/4"
405956	3/8"
405957	1/2"
405958	5/8"
405959	3/4"
405960	7/8"
405961	1"
405962	1 1/8"
405964	1 3/8"



L	L1	Z
44.0	21.0	26.0
45.0	20.5	27.0
47.0	24.0	29.5
46.0	24.0	28.5
53.0	25.0	35.5
53.5	25.0	32.5
54.0	27.0	36.5
54.5	27.0	33.5
53.0	27.0	31.0
61.0	28.5	43.5
61.5	28.5	40.5
60.0	28.5	38.0
59.5	28.5	35.5
72.5	37.5	49



L	Z
32.5	14.5
33.0	15.0
31.5	14.0
39.0	18.0
42.5	20.5
50.0	26.0
53.0	29.5
57.0	31.5
69.0	35.0



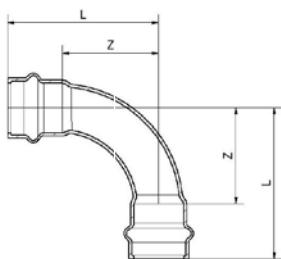
### Long Radius Elbow - 90 Degree

Product Code	Size
406082	1/2"
406084	5/8"
406083	3/4"
406085	7/8"
406086	1 1/8"
406087	1 3/8"

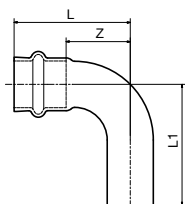


### Elbow - 45 Degree OD x ID

Product Code	Size
405976	3/8"
405977	1/2"
405978	5/8"
405979	3/4"
405980	7/8"
405981	1 1/8"
405982	1 3/8"



L	Z
43.0	26.0
50.0	29.0
56.0	34.0
66.0	42.0
77.0	51.5
89.0	54.7



L	L1	Z
33.0	34.5	15.0
31.5	34.5	14.0
39.0	45.0	18.0
42.5	48.0	20.5
50.0	53.0	26.0
57.0	61.5	31.5
69.0	82.0	35.0



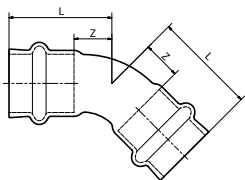
### Elbow - 45 Degree

Product Code	Size
406038	1/4"
405966	3/8"
405967	1/2"
405968	5/8"
405969	3/4"
405970	7/8"
405971	1"
405972	1 1/8"
405974	1 3/8"

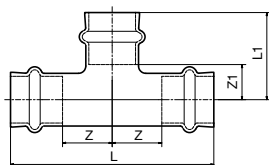


### Tee

Product Code	Size	L
405984	1/4"	54.0
405985	3/8"	63.0
405986	1/2"	66.0
405987	5/8"	76.0
405988	3/4"	84.0
405989	7/8"	89.0
405990	1"	92.0
405991	1 1/8"	95.0
405993	1 3/8"	112.0



L	Z
23.5	5.5
26.0	8.0
24.0	6.5
28.0	7.0
31.5	9.5
34.0	10.0
35.5	12.0
39.5	14.0
52.0	18.0



Z	L1	Z1
9.0	27.0	9.0
13.5	31.0	13.0
15.5	28.0	10.5
17.0	32.0	11.0
20.0	36.0	14.0
20.5	38.5	14.5
22.5	40.0	16.5
22.0	43.0	17.5
22.0	56.0	22.0



### Flare Nut Adaptor

Product Code	Size (D1 x D2)	L
405661	1/4"	54.0
405662	3/8"	61.0
405663	1/2"	63.5
405664	5/8"	74.0
405665	3/4"	81.5



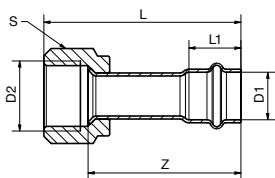
### Stop End

Product Code	Size
406039	1/4"
406040	3/8"
406041	1/2"
406042	5/8"
406043	3/4"
406044	7/8"
406045	1"
406046	1 1/8"
406076	1 3/8"

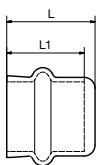


### Depth Gauge

Product Code
2131548



L1	Z	S
18.0	46.0	17.0
18.0	50.0	22.0
17.5	51.5	24.0
21.0	58.0	27.0
22.0	63.5	34.0



L	L1
19.5	18.0
19.5	18.0
19.0	17.5
22.5	21.0
23.5	22.0
26.0	24.0
25.5	23.5
27.5	25.5
37.5	34.0



## >B< Lubricant Oil

Product Code

406047

## 14. Installation Instructions

>B< MaxiPro fittings must be installed by an appropriately trained and qualified person to work on the installation. All installations must be completed in line with local regulations and by-laws governing the installation, and all applicable health and safety practices must be adhered to.

**Important:** Select the correct size of tube, fitting and jaw for the job. Ensure the fitting and tube are kept free of any dust or dirt and that the O-ring is undamaged. Check the inner pressing contour of the jaw is free of dirt and debris prior to use.

- Do not force tube ends together prior to making joints. Joints should only be made on an unstressed pipework assembly.
- A joint is finished after one complete compression cycle of the tool.
- Do not press any >B< MaxiPro fittings more than once.
- Pipework alignment must be completed prior to pressing.
- Do not rotate joints after they have been pressed.

## Tube Preparation



### Step 1 – Cut the tube to length

- Use a rotary tube cutter.
- Ensure that the tube is cut square.
- Check the pipe has retained its shape and is damage free.



### Step 2 – Deburr and remove all sharp edges externally

- Angle the tube downwards to prevent filings entering the tube.
- Use a deburrer in one direction clockwise.
- Make sure the external surface of the tube end is smooth and free from burrs or sharp edges.



### Step 3 – Use a pencil type deburrer on internal edges

- Make sure the internal surface of the tube end is smooth and free from burrs or sharp edges.



### Step 4 – Thoroughly clean the tube ends and remove scratches

- Remove light scratches using Rothenberger Rovlies or a similar cleaning pad to polish the tubing. Cleaning should be done radially to avoid creating scratches along the tube.
- Tube ends must be free from scratches, oxidation, dirt and debris not less than socket length.



- If deep scratches are still visible, cut the tube back to a clean section.

## Marking and Inserting Tube



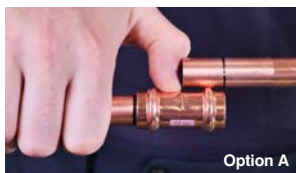
### Step 1 – Ensure the O-ring is seated and lubricated

- Check the fitting is the correct size for the tube.
- Check the O-rings are correctly seated.
- Visually inspect that the O-rings are clean, free from debris and appropriately lubricated.
- Apply >B< Lubrication Oil if O-ring is dry.



### Step 2 – Mark insertion depth

- The tube must be fully inserted into the fitting until it reaches the tube stop.
- To reduce the risk of dislodging the O-ring, rotate the tube or fitting (if possible) while slipping it into the fitting.
- Mark the insertion depth on the tube.



### Step 3 – Check the depth mark

- Remove the tube and align with fitting socket, check that the depth mark is correctly positioned.
- The insertion depth mark is used as a reference prior to pressing the joint.



### Alternatively to Step 2 & 3, use depth gauge

- Insert tube into correct socket in depth gauge.
- Check window to see the tube is fully inserted.
- Mark the insertion depth on the tube.



### Step 4 – Insert the tube fully into the fitting up to the tube stop

- To reduce the risk of dislodging the O-ring, rotate the tube or fitting (if possible) while slipping it into the fitting.

- Prior to pressing, ensure the tube has not moved out from the fitting socket.
- Use the insertion depth mark as a guide.

## Pressing the Fitting: 1/4" - 11/8"



### Step 1 – Align jaws squarely on the fitting

- Ensure pipework is correctly aligned prior to pressing.
- Ensure the correct size jaw is inserted into the tool.
- The bead on the fitting should fit centrally in the groove of the jaw.
- The jaws must be placed squarely on the fitting, locating the groove on the bead.



### Step 2 – Complete the joint with approved tool – press once only

- Depress and hold the button to complete the pressing cycle.
- Pressing is complete when the jaws are fully closed and the piston retracts.
- Complete the press cycle once only – do not repress.

## Pressing the Fitting: 1 3/8"



### Step 1 – Fit the pressing ring

- Using the appropriate size pressing ring, open, and locate onto the fitting bead.
- Close the pressing ring fully



### Step 2 – Engage adaptor

- With the adaptor jaw fitted in the press tool, open the actuator and locate it into the aperture of the pressing ring.
- Check for any tube movement prior to pressing



### Step 3 – Complete the joint with the press tool

- Press and hold the trigger button on the press tool to begin the pressing cycle.
- The tool automatically stops when the cycle has been completed.

**IMPORTANT:** The joint is complete after one full cycle. DO NOT crimp any fitting more than once.

## Complete



### Step 4 – Mark Completed Joint

- Mark the completed joint after pressing.
- This enables joints to be inspected easily before testing and insulating the pipework.

# > Press Tools and Jaws <





## 15. Press tools and jaws

The >B< MaxiPro system is compatible with the following tools:

- Rothenberger Romax Compact
- Rothenberger Romax Compact TT
- Rothenberger Romax 3000
- Rothenberger Romax 4000

### **Rothenberger press tools and jaws have been specifically engineered for >B< MaxiPro**

With strict Australian piping tolerances, it is imperative that your tool works in unison with your press fittings. Therefore, it is recommended to use Rothenberger press tools when installing >B< MaxiPro for the best press solution.



### **Rothenberger Romax Compact TT**

#### **Application sizes: 1/4" to 1 1/8" >B< MaxiPro fittings**

- Not compatible with >B< MaxiPro 1 3/8".
- Compact, lightweight, twin cylinder design – optimised for one hand operation.
- CFT® – technology for constant axial 19kN shearing force.
- Safety latch to ensure jaw cannot come out during operation.
- Easy to use LED status indication – flashing red when battery charge is low and will lock the machine.
- Simple and safe operation design – hold start button – tool automatically stops once press cycle is complete.
- Safety yellow button – press to release pressure and stop press cycle.
- Convenient 20,000 cycle interval between service requirements.
- Head positioning up to 270° rotation – easy fitting in difficult locations.
- Li-Ion battery technology – long lasting operation between charges.
- Patented AIR COOLED charging technology.

Specifications
Battery voltage – 18V
Battery capacity – 2Ah and 4Ah
Rated power consumption – 280 Watts
Max piston force – 19kN
Pressing time – 3 seconds
Dimensions (LxWxH) – 80mm x 143mm x 336mm
Weight (less jaws) – 2.5kg
Working range – copper system 1/4" to 1 1/8"
Typical A-rate noise level – 71dB(A)
Battery re-charge time periods: <ul style="list-style-type: none"> <li>• 2Ah = 40 minutes</li> <li>• 4Ah = 80 minutes</li> </ul>



Rothenberger Romax Compact TT Tool Kits	
Code	Description
8078100	Rothenberger Compact TT Tool Only
7701211	Rothenberger Compact TT >B< MaxiPro Tool Kit 1/4-3/4"
7701212	Rothenberger Compact TT >B< MaxiPro Tool Kit 1/4-1"
7701213	Rothenberger Compact TT >B< MaxiPro Tool Kit 1/4-1 1/8"

## 15. Press tools and jaws



### Rothenberger Romax 4000

#### **Application sizes: 1/4" to 1 3/8" >B< MaxiPro fittings**

Ergonomically designed and better weight distribution compared to the 3000 – reducing fatigue during extended use.

- Wide application range.
- Fast pressing – automatic cycle complete in 4 seconds.
- Easy to use LED status indication – flashing red when battery charge is low and will lock the machine, remains ON when tool has reached 40,000 cycles of use and requires servicing.
- Bright white light LEDs to illuminate work space during pressing cycle.
- Simple and safe operation design – hold start button – tool automatically stops once press cycle is complete.
- Safety yellow button – press to release pressure and stop press cycle.
- Long 40,000 cycle interval between service requirements.
- Head positioning up to 270° rotation – easy fitting in difficult locations.
- Li-Ion battery technology – long lasting operation between charges.
- >B< MaxiPro 1 3/8" requires an actuator and sling.

Specifications
Battery voltage – 18V
Battery capacity – 2Ah and 4Ah
Rated power consumption – 540 Watts
Max piston force – 32kN
Pressing time – 4 secs (nominal)
Dimensions (LxWxH) – 447mm x 125mm x 75mm
Weight (less jaws) – 3.54 kg
Working range – copper system 1/4" to 1 3/8"
Typical A-rate noise level – 71dB(A)
Battery re-charge time periods: <ul style="list-style-type: none"> <li>• 2Ah = 40 minutes</li> <li>• 4Ah = 80 minutes</li> </ul>



Rothenberger Romax 4000 Tool Kits	
Code	Description
7701304	Rothenberger 4000 Tool Only
7701014	Rothenberger 4000 >B< MaxiPro Tool Kit 1/4-3/4"
7701015	Rothenberger 4000 >B< MaxiPro Tool Kit 1/4-1"
7701016	Rothenberger 4000 >B< MaxiPro Tool Kit 1/4-1 1/8"
9512509	Rothenberger >B< MaxiPro Actuator & 1 3/8" Sling

## Critical Operating Instructions - Tool & Jaw

Only operate the Rothenberger press tool and jaws as per instructions in your 'User Operating Manual, Instructions for Use'. Proper usage includes compliance with the operating manual, inspection and servicing conditions and adherence to all relevant safety regulations. The equipment must only be used by qualified tradespeople that have a trained understanding on how to use the press tool and jaw system properly. Failure to do so will lead to safety risk, poor workmanship, and incorrect use of the press and jaw that is not covered under warranty. Only use Rothenberger press tools and jaws with compatible press fittings that have been tested and approved by Rothenberger and associated fitting and pipe manufacturers (>B< MaxiPro).

- Always start with a safety check, reminding yourself of the yellow emergency stop button to deactivate a press cycle.
- Charge battery fully before first use for optimal number of 'presses per charge'.
- LED flashes red to indicate when you have a flat battery.
- Insert battery correctly until it clicks into place and LED light flashes briefly to indicate contact made.
- Insert press jaw and close bolt down correctly. Only use the correct jaw to tool to fitting combination.
- Open the jaw by squeezing from the base of the jaw NOT the front tip (it can crush your fingers!).
- Place jaw squarely on fitting. Align with bead.
- Half engage the start button for the handy LED lights.
- Fully engage the start button for a full press cycle. Activate the press tool and jaw only on a fitting.
- Take the time to ensure the correct pipe preparation – cut pipe square, deburr, remove sharp edges and oxidation and mark insertion depth. These pipe prep steps are critical for a correct press and quality workmanship.
- Follow all installation instructions supplied by the fitting and pipe manufacturers. Imperfect pipe joints must only be pressed again using a new fitting, DO NOT re-press the same fitting.
- During the press cycle, visually check that the press jaw fully closes at the end of the press cycle.
- After pressing, check the installation with appropriate testing equipment and ensure it is leak proof.

## Regular Maintenance Instructions - Tool & Jaw

### Tool – Always clean and grease and store in case

Your Rothenberger Tool is one of the lightest and most ergonomic designed tools that delivers the most consistent press force (CFT® - Constant Force Technology). With regular maintenance and service it generates up to 3.2 tonnes of force in your hand, so it requires regular care and maintenance.



1. Clean and grease the piston ram and drive rolls ALWAYS after every use to maintain performance – especially the internal guide rail OR all the 'moving metallic parts'.
- Watch heavy water areas. Do not expose power tools to rain or wet conditions. Always store in case.



2. Ensure the jaw locking bolt is closed correctly by fully inserting the bolt through the jaw and rotating the bolt arm down 180 degrees.
- **Note:** The bolt is only secured when fully inserted and rotated into the downward position.



Continued on next page

## Regular Maintenance Instructions - Tool & Jaw

**Battery – Always clean contact points and store in a charged state**



1. Clean contact points on battery and only store battery in a charged state, plus it's always ready for use.
- Do not force the press tool – it will do the job better and safer at the rate for which it was designed.
  - Accidents are caused by poorly maintained press tools and jaws. Take the time to maintain properly.

**Jaws – Always clean, apply lubricant spray and store in case**



1. Clean jaws ALWAYS after every use. Keep the inside jaw profile free of any grease and grit.
- Jaws must be maintained with liquid lubricant spray. Do not use spray on the tool, only the jaws.
  - Ensure any excess spray is removed. Always store in case.



## **Servicing and Warranty - Tool and Jaw**

Rothenberger prides itself on leading edge design, the highest quality, and leading after-sale service support. With ownership of your Rothenberger tool comes our commitment to support you. We want to help you look after your tool, so you don't compromise your reputation.

- Simply return your Rothenberger press tool and jaw set to your local Reece branch – they will sort out the rest.
- A qualified tool service technician will inspect and service your tool to ensure high performance and safety.
- Comprehensive spare parts are readily available locally to support your Rothenberger tool and jaws.
- Jaws will also be checked at the annual service interval for any damage, defects and general wear and tear that could affect the press performance or safety.

## **Warranty Coverage**

- After 1 year or 20,000 (Romax Compact/Compact TT) or 40,000 presses (Romax 3000/4000), the LED lights up red after each press.
- A press cycle count will be made as part of your annual tool and jaw servicing and report.
- If a serial number sticker is damaged, the warranty will be null and void.
- The warranty does not cover damage caused by incorrect use of the equipment.
- Tool 4 years, only with regular 1 year or cycle count servicing (like servicing your car!).
- Battery 12 months, Jaws 12 months.

# > Design Considerations <





## 16. Design Considerations

All refrigeration pipelines must be designed so that the number of joints is kept to a practical minimum. Refrigeration pipelines should be designed in compliance with the following key standards and codes of practice:

- AS/NZS 5149.2:2016 Australian/New Zealand Standard™ Refrigerating Systems  
Part 2: Safety requirements for fixed applications.
- AS 4426:1997 Thermal insulation of pipe work, ductwork and equipment - Selection, insulation and finish.
- AS 1345-1995 Identification of the contents of pipes, conduits and ducts.
- The National Construction Code of Australia.
- Australia and New Zealand Refrigerant Handling Code of Practice 2007  
Part 1: Self-contained low charge systems.
- Australia and New Zealand Refrigerant Handling Code of Practice 2007  
Part 2: Systems other than self-contained low charge systems.
- The Australian Refrigeration and Air-conditioning Code of Good Practice  
Part 1: Reduction of Emissions of Fluorocarbon Refrigerants in Commercial and Industrial Refrigeration and Air-conditioning Applications.
- The Australian Refrigeration and Air-conditioning Code of Good Practice  
Part 2: Reduction of Emissions of Fluorocarbon in Residential Air-conditioning Applications.

Nominal Size	Nominal External Pipe	Nominal External Bead Unpressed (D)
Inches	mm	mm
1/4"	6.35	11.70
3/8"	9.52	15.80
1/2"	12.70	20.15
5/8"	15.90	23.85
3/4"	19.10	27.40
7/8"	22.30	31.45
1"	25.40	34.70
1 1/8"	28.60	37.80
1 3/8"	34.90	45.00mm

- The Australian Refrigeration and Air-conditioning Code of Good Practice  
Part 3: Reduction of Emissions of Fluorocarbon in Domestic Refrigeration Applications.

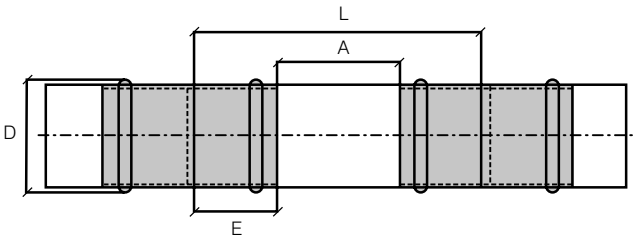
### Pipework support

All pipework should be supported by the use of appropriate clips, brackets or supports. Please refer to:

- The National Construction Code of Australia.
- AS/NZS 5149.2:2016 Australian/New Zealand Standard™ Refrigerating Systems.  
Part 2: Safety requirements for fixed applications.

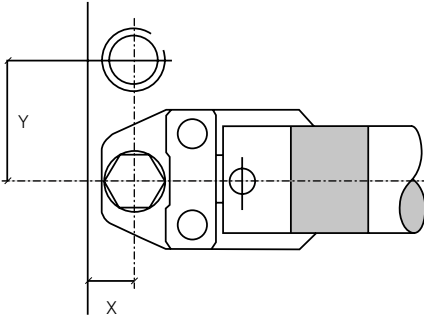
### Insertion depth and minimum distances between pressings

Due to the reforming of the tube profile when pressed, it is advised that a minimum distance is allowed between each fitting. Please see table below.

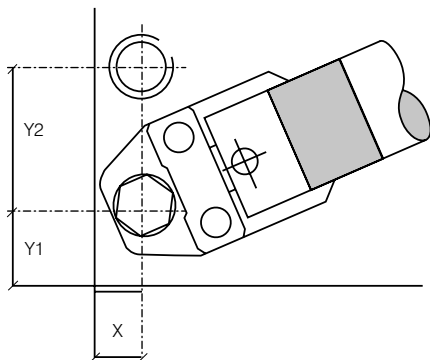


Minimum Distance (A)	Minimum Pipe Length (L)	Insertion Depth (E)
mm	mm	mm
10	46.0	18.0
10	47.0	18.0
15	53.0	19.0
15	59.0	22.0
20	66.0	23.0
20	70.0	25.0
25	73.0	24.0
25	78.0	26.5
35	105.0	35.0

# Space required for the pressing process



Space required for pressing, wall and pipe clearances		
External Pipe	X	Y
Size	mm	mm
1/4"	30	55
3/8"	30	55
1/2"	25	55
5/8"	25	55
3/4"	25	55
7/8"	30	55
1"	30	55
1 1/8"	35	55
1 3/8"	35	60



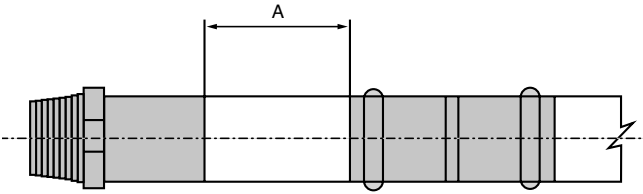
Space required for pressing, wall corner and pipe			
External Pipe	X	Y1	Y2
Size	mm	mm	mm
1/4"	40	40	100
3/8"	40	40	105
1/2"	40	40	105
5/8"	40	40	105
3/4"	40	40	105
7/8"	55	55	110
1"	60	60	115
1 1/8"	60	60	115
1 3/8"	60	60	120

## Pipework protection

Copper has a high resistance against corrosion. However, in some cases external protection may be necessary against corrosive conditions. Please refer to:

- The National Construction Code of Australia.
- AS/NZS 5149.2:2016 Australian/New Zealand Standard™ Refrigerating systems Part 2: Safety requirements for fixed applications.
- AS 4426:1997 Thermal insulation of pipework, ductwork and equipment - Selection, insulation and finish.

## Minimum distance for press fittings from an existing brazed joint



### Localised annealing

To ensure proper sealing of both the brazed and >B< MaxiPro fitting, the following minimum distances must be maintained between the two fittings.

Tube Size	Minimum Clearance (A)
Inches	mm
1/4"	10
3/8"	10
1/2"	15
5/8"	15
3/4"	20
7/8"	20
1"	25
1 1/8"	25
1 3/8"	35

**Note:** A = clearance between fitting ends

**Note:** It is important that there is no residual solder or other foreign debris on the tubing to be inserted into the >B< MaxiPro fitting. The surface condition on the area of the press joint should be clean and free from debris.

## Brazing near >B< MaxiPro joint

**Caution** – Brazing near >B< MaxiPro joints should be avoided as this may cause the seal to degrade due to heat transfer. The table below states the minimum distance away from the press joint which is acceptable to braze. If this distance cannot be maintained then adequate precautions must be taken, such as fabricating the brazed section prior to assembly with the press fittings, wrapping in a wet rag or applying a heat barrier (such as Rectorseal Hot Block), to prevent heat transfer to the press fitting during brazing.

Tube Size	Minimum Clearance (A)
Inches	mm
1/4"	250
3/8"	300
1/2"	350
5/8"	450
3/4"	500
7/8"	600
1"	650
1 1/8"	700
1 3/8"	900

**Note:** A = clearance between fitting ends

## Earth continuity

>B< MaxiPro fittings maintain earth continuity without the need for additional continuity straps.

## Pipework identification and insulation

All pipework must be installed in accordance with:

- AS 4426–1997 Thermal insulation of pipework, ductwork and equipment - Selection, installation and finish.
- AS 1345-1995 Identification of the contents of pipes, conduits and ducts.

## Testing and commissioning of air-conditioning and refrigeration systems

Testing and commissioning of air-conditioning and refrigeration systems should be in accordance with the requirements specified in:

- AS/NZS 5149 Refrigerating systems and heat pumps - Safety and environmental requirements: Parts 1 to 4.
- Australia and New Zealand Refrigerant handling code of practice 2007  
Part 1: Self-contained low charge systems.
- Australia and New Zealand Refrigerant handling code of practice 2007  
Part 2: Systems other than self-contained low charge systems.
- The Australian Refrigeration and Air-conditioning Code of Good Practice  
Part 1: Reduction of Emissions of Fluorocarbon Refrigerants in Commercial and Industrial Refrigeration and Air-conditioning Applications.
- The Australian Refrigeration and Air-conditioning Code of Good Practice  
Part 2: Reduction of Emissions of Fluorocarbon in Residential Air-conditioning Applications.
- The Australian Refrigeration and Air-conditioning Code of Good Practice  
Part 3: Reduction of Emissions of Fluorocarbon in Domestic Refrigeration Applications.

Tightness testing should be completed in line with the above standards and codes of practice. Vacuum evacuation should follow to remove air, moisture, and non-condensable gases.

- Important factors for the vacuum process:
  - Test equipment must be well maintained, calibrated and periodically replaced.
  - Replace the oil in the vacuum pump at regular intervals.
  - Nylog should be used on the test connections to minimise joint leaks.

- Small systems that contain low volumes will experience faster changes in pressure, this does not mean the system is leaking.
- If your system fails to achieve or hold a vacuum:

### **Failure to achieve a vacuum**

- If you can't achieve the required vacuum, you either have a leak, moisture in the system or a problem with the vacuum pump. The pump may not be in good condition, the oil may need to be changed, the gas ballast valve is open or the pump does not have sufficient flow rate for the system.

### **Failure to hold a vacuum**

- If you can't hold a vacuum it may be for one of the following reasons:
  - **There is a leak.**  
In this case, the pressure will rise continuously when the pump is isolated. The leak could be at the connections to the pump or test equipment. Isolate from the pipework and apply a suitable thread sealant to all test equipment connections to improve the seal.
  - **Alternatively, the leak could be in the system.**  
Leaks should have been identified and fixed during the pressure leak test procedure. An ultrasonic leak detector can help to identify leaks in the system under vacuum.
  - **There is moisture in the system.**  
Extend the evacuation period.
  - **There is still refrigerant dissolved in the compressor oil.**  
When the pump is isolated, the pressure will rise and plateau. Extend the evacuation period.
  - **There is moisture in the system.**  
Extend the evacuation period.
- No remedial action (e.g. cutting out fittings from the system) should be taken until a proper fault finding exercise has been completed.
- Care must be taken to ensure a >B< MaxiPro joint will not be close enough to the liquid charging point that the temperature of the joint drops below -40°C when charging the system.

## 17. >B< MaxiPro Tube Compatibility Table

Fitting Size	Size				
	Inch	mm	0.71	0.81	0.91
1/4	1/4	6.35	● ■	● ■	● ■
3/8	3/8	9.53	● ■	● ■	● ■
1/2	1/2	12.70	● ■	● ■	● ■
5/8	5/8	15.88		● ■	● ■
3/4	3/4	19.05			● ■
7/8	7/8	22.23			● ■
1	1	25.40			■
1 1/8	1 1/8	28.58			■
1 3/8	1 3/8	34.93			■

- ■ Green cap
- ■ Pink cap
- ■ Coil lengths in annealed condition
- Straight lengths in hard/half hard condition

AS/NZS 1571

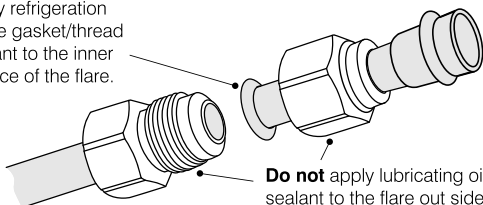
Nominal Wall Thickness

1.02	1.14	1.22	1.40	1.63	1.83	2.03
■						
● ■						
■		● ■				
	■	■	■	■		
		■		■		
		■		■	■	
		■				■

## 18. Installing a >B< MaxiPro female flare connector to a male flare connector.

Make the flare connection prior to pressing the >B< MaxiPro joint. If this is not possible care must be taken to prevent rotational forces being applied to the pressed joint.

Apply refrigeration grade gasket/thread sealant to the inner surface of the flare.

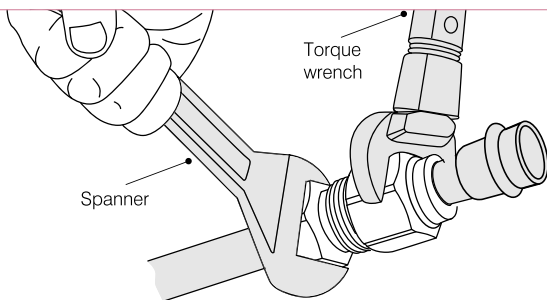


**Do not** apply lubricating oil or sealant to the flare out side threads and nut inside threads to avoid overtightening.

Copper flare

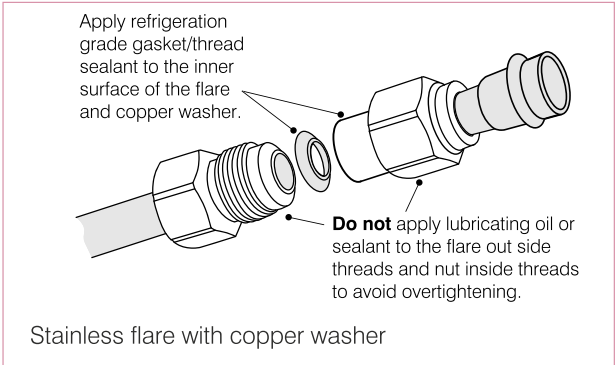
Align the centers of both flares and tighten the flares by hand.

**Note:** A high viscosity refrigerant grade oil may be used if sealant is not available.



Tighten joint using torque wrench

Fully tighten using spanner and torque wrench to the torque values set out in table 9. **Do not over tighten.**



Align the centers of both flares and tighten the flares by hand.

**Note:** A high viscosity refrigerant grade oil may be used if sealant is not available.

**Table 9**

Flares Tightening Torque		
Size	N m	ft lbf
1/4"	14-18	11-13
3/8"	33-42	25-31
1/2"	50-62	37-45
5/8"	63-77	47-56
3/4"	90-110	67-81
Do not over tighten		

# >FAQs<

## 19. Frequently Asked Questions

Q. How long has Conex Bänninger been around?

**A. Since 1909.**

---

Q. Where are the products manufactured?

**A. Poland and Spain.**

---

Q. Does >B< MaxiPro work on both hard and soft copper?

**A. Yes, >B< MaxiPro is a press fitting system for use with hard, half hard or annealed copper tube conforming to AS/NZS 1571. Please see Tube Compatibility Table on pages 52-53.**

---

Q. Can you use >B< MaxiPro to crimp to aluminium, steel, or stainless steel?

**A. No, >B< MaxiPro is specifically designed for copper to copper connections. Connecting to dissimilar metals can cause formicary corrosion issues that could result in a failure.**

---

Q. What material is the O-ring made of?

**A. The O-ring is manufactured from Hydrogenated Nitrile Butadiene Rubber (HNBR).**

---

Q. Are there any storage issues, including where the fittings are stored in the vehicles exposed to extremes of high or low temperature?

**A. No, the product is not subject to degradation under normal storage conditions – provided it is kept in original packaging and not exposed to direct sunlight for long periods. Please see page 14 for details regarding fitting storage.**

---

Q. What refrigerants are approved for use with >B< MaxiPro?

**A. Please see Refrigerant Compatibility Table on pages 10-11 for a full list of refrigerants approved for use with >B< MaxiPro.**

---

Q. What oils are approved for use with >B< MaxiPro?

**A. >B< MaxiPro is approved for use with POE, PAO, PVE, AB and mineral oil.**

---

Q. If a fitting leaks on installation, can you braze the fitting in rather than cutting out the joint and having to replace missing pipe?

**A. No, if a fitting that has been pressed is leaking, the fitting must be cut out and replaced. You should not attempt to braze the fitting, as you may melt the O-ring material and thus introduce contaminants into the system that could cause other system issues.**

---

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

**A. No, >B< MaxiPro has been thoroughly freeze / thaw tested.**

---

Q. Are there any concerns with corrosion where installations are made in coastal areas or with respect to cleaning agents?

**A. No, >B< MaxiPro has been Acid Salt Spray tested to ASTM G85. As with all copper installations, exposure to ammonia should be avoided.**

---

Q. Do you have a solution for crimping onto flared tubing (e.g. tubing coming out of the condenser and evaporator on residential units)?

**A. No, we do not have a specific product designed for crimping over flared tubing. However, where there is at least 50mm of straight copper tubing after the flared end and it is accessible with the jaws, we suggest that you cut the flared end off and crimp directly to the tube.**

---

Q. What standards does >B< MaxiPro comply with?

**A. >B< MaxiPro fittings are:**

- **UL 207 certified, certificate no. SA44668.**
  - **UL 109-7 Pull Test, compliant.**
  - **UL 1963-79 Tests of Gaskets and Seals used in Refrigerant Systems, compliant.**
  - **ISO 5149-2, compliant.**
  - **ASTM G85, compliant.**
  - **AS/NZS 5149.2 compliant.**
  - **ISO 14903 - Tightness test, compliant.**
  - **ISO 14903 - Temperature, pressure cycling and vibration test, compliant.**
  - **ISO 14903 - Freeze / thaw test, compliant.**
-

Q. What pipe diameter is acceptable if a crimp joint is going to be made with >B< MaxiPro?

**A. >B< MaxiPro is suitable for use with hard, half hard or annealed copper tube conforming to AS/NZS 1571. Mechanical joints shall not be used on annealed temper copper tube in sizes larger than 7/8 inch OD size per International Mechanical Code (IMC) and 3/4 inch nominal size per Uniform Mechanical Code (UMC). For more information on tube compatibility, please see table on pages 52-53.**

---

Q. What is the warranty on >B< MaxiPro fittings?

**A. >B< MaxiPro has a 15 year warranty from the date of purchase. This covers against faults caused by defective manufacture of fittings. It does not cover faults arising from incorrect installation. All >B< MaxiPro fittings must be installed by a tradesperson licensed to work on systems containing refrigerant.**

---

Q. The product specifications state that the application temperature limits are -40°C to 121°C. What happens if we go beyond that limit?

**A. >B< MaxiPro is suitable for continuous operating at temperatures between -40 and 121°C. It will also cope with short term excursions up to 140°C. Operating at temperatures outside this range is not acceptable and may lead to failure.**

---

Q. How clean are >B< MaxiPro fittings?

**A. >B< MaxiPro fittings comply with the cleanliness standards as required in the following Copper Tube Standards AS/NZS 1571. Keep the bag sealed to protect fittings from contamination.**

---

Q. How do the fittings cope with vibration from the system?

**A. Vibration is a recognised cause of leaks and the system must be designed and installed to comply with all local standards and codes of practice which aim to minimise vibration.**  
**>B< MaxiPro fittings have been extensively tested to ensure the joint will not leak as a result of system vibration and complies with the following standards:**

- ISO 14903 temperature, pressure cycling and vibration test
- UL 109, vibration
- UL 207 fatigue shock test

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Q. Will the O-ring be damaged if acid develops in the refrigeration system?

**A. Acid will only develop in systems containing moisture or after a compressor burn out. A good quality liquid filter drier should be used in all systems to capture moisture. After a compressor burn out, a suction filter drier should be used to capture any residual acid or debris.**

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Q. When pressed on small size fittings, particularly elbows, a small amount of rotational movement can be induced to the joint. Will this affect the security of the joint?

**A. No, some rotational movement is quite acceptable, the joint will not leak nor will it come apart under the pressure loading and during system operation. Some joint movement is good as it will allow for expansion and contraction in the pipe-work system.**

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Q. Can you press a fitting more than once?

**A. No, >B< MaxiPro fittings can be pressed only once.**

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Q. Is >B< MaxiPro approved for drinking water systems?

**A. No, >B< MaxiPro is not approved for drinking water systems.**

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Q. Can >B< MaxiPro be used on heating and hot water systems?

**A. No, >B< MaxiPro is approved for use in air conditioning and refrigeration applications only.**

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Q. If my system fails to achieve or hold a vacuum what should I do?

**A. Please see 'Failure to achieve a vacuum' and 'Failure to hold a vacuum' sections on page 51.**

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Q. What are the benefits of >B< MaxiPro fittings?

**A. >B< MaxiPro is a flame-free solution, that is fast, simple and reliable to install. Please see 'Key Features' section on pages 6-7.**

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## 20. Abbreviations

ISO 9001	Certified Quality Management System
AS/NZS 1571:1995	Australian and New Zealand Standard for Copper – Seamless tubes for air conditioning and refrigeration
AS/NZS 5149.1:2016	Refrigerating systems and heat pumps - Safety and environmental requirements - Part 1: Definitions, classification and selection criteria
AS/NZS 5149.2:2016	Refrigerating systems and heat pumps - Safety and environmental requirements - Part 2: Design, construction, testing, marking and documentation
AS/NZS 5149.3:2016	Refrigerating systems and heat pumps - Safety and environmental requirements - Part 3: Installation site
AS/NZS 5149.4:2016	Refrigerating systems and heat pumps - Safety and environmental requirements - Part 4: Operation, maintenance, repair and recovery
HNBR	Hydrogenated Nitrile Butadiene Rubber
UNS	Unified Numbering System
POE oil	Polyol Ester Oil
POA oil	Poly-alpha-olefin Oil
PVE oil	Polyvinylether oil
AB oil	Alkyl Benzene Oil
UL 207	Standard for Refrigerant-Containing Components and Accessories, Nonelectrical
UL 109 - 7	Standard for Tube Fittings for Flammable and Combustible Fluids, Refrigeration Service, and Marine Use. Section 7 Pull Test

UL 1963 – 79	Standard for Refrigerant Recovery/Recycling Equipment. Section 79 Tests of Gaskets and Seals Used in Refrigerant Systems
ISO 5149 - 2	Refrigerating systems and heat pumps - Safety and environmental requirements - Part 2: Design, construction, testing, marking and documentation.
IMC	International Mechanical Code
UMC	Universal Mechanical Code
ASTM G85 - 11	Standard Practice for Modified Salt Spray (Fog) Testing
LED	Light Emitting Diode
CFT	Constant Force Technology
SMS	Short Message Service
ISO 14903	International Standard for Refrigerating systems and heat pumps — Qualification of tightness of components and joints. Section 7.6 Pressure temperature vibration tests (PTV).
UL 109 - 8	Standard for Tube Fittings for Flammable and Combustible Fluids, Refrigeration Service, and Marine Use. Section 8 Vibration test.



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