

# Auspex Water Manual



**A TRADITION OF TRUST**

# About Auspex

Auspex started in 1996 as a family-owned business, leading the way in alternative pipe and fitting systems in the Australian plumbing market. Built on a 'Tradition of Trust' Auspex has continued to expand its product range to meet the ever-growing market demands.

In 2007, RWC acquired Auspex from the Bines family and continued Auspex's strong commitment to plumbers. This has led to new product innovations and set new standards in the plumbing industry.

With Auspex pipe manufacturing operations based in Australia, Auspex understands the needs of its customers, and responds rapidly to develop new fittings, create special short runs to satisfy unusual situations and changing market environments.

Auspex is committed to remaining at the forefront of PE-X pipe technology. New products and tooling are continually being developed to enhance the system and the brand is expanding into associated areas. It's this forward focus that will see Auspex continue to grow into the future.

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## The Auspex Crimp System, made for both cold and hot water applications, has revolutionised pipe fitting with its 'cut, fit, crimp, done' process.

The crimp system comprises PE-X pipe, DR brass fittings, copper crimp rings and a specially engineered jointing tool, ensuring that all your jobs are quick, hassle free, cost effective and of the highest quality. The fittings are manufactured and tested to comply with the performance requirements of AS/NZS 2537.

Auspex are constantly working to improve the crimp system to make it as plumber friendly as possible.

### Advantages of Auspex Crimp System

1. Fast and simple installation
2. Reliable, secure connection
3. Neat, compact, robust DZR brass fitting for increased strength and corrosion resistant
4. Rolled crimp ring permanently part of fitting
5. Pipe insertion depth confirmed with viewing window
6. Approved for behind the wall and underground application
7. Quality engineered in Australia
8. Extensive range of transition fittings to Cu, PB, PE-X SDR7.4 and SDR9 pipes
9. Installed in Australian buildings since 1997

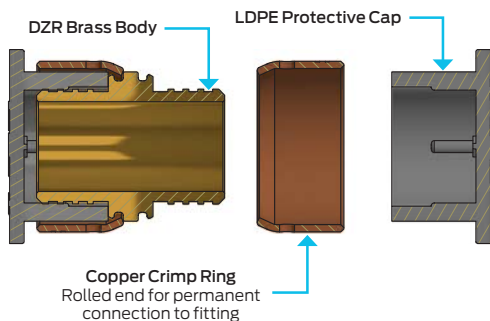


## Auspex Design

Auspex fittings incorporate a number of unique features.

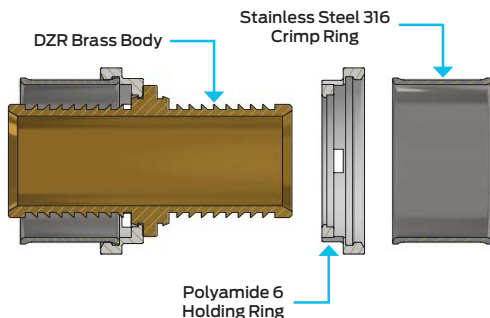
### Auspex Brass Design

16mm, 20mm and 25mm



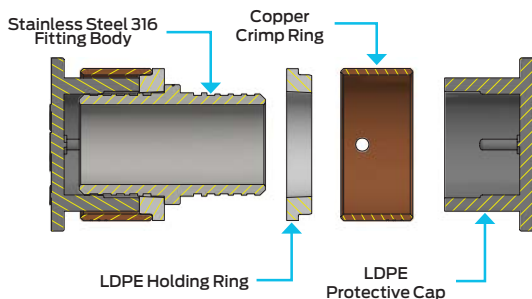
### Auspex Brass Design

32mm



### Auspex Stainless Steel Design

16mm, 20mm and 25mm



## Approved Applications

The Auspex system has WaterMark certification to AS/NZS 2537 and AS 2492 product standard for use in potable water. Auspex plumbing systems are approved for hot and cold potable water installations above and below ground. Please consult with local codes for final approval. Failure to comply with the above types of pipe applications could result in connection failures.

## References

- A.** AS/NZS 4020 – Testing of products for use in contact with drinking water
- B.** AS 2492 – Cross-linked polyethylene (PE-X) pipes for pressure applications
- C.** AS/NZS 2537 – Mechanical jointing fittings for use with crosslinked polyethylene (PE-X) for pressure applications
- D.** AS 3688 – Water supply and gas systems - Metallic fittings and end connectors
- E.** AS 1432 – Copper tubes for plumbing, gasfitting and drainage applications
- F.** AS 2345 – Dezincification resistance of copper alloys
- G.** AS/NZS 3500 – Plumbing and drainage

## Potable Water Approved AS/NZS 4020

AS/NZS 4020 prescribes tests for analysing the suitability of products for use in contact with drinking water, with regard to their effect on the quality of the water. It is a requirement of Watermark Certification.



**Auspex pipe is intended for use by licensed plumbing tradesmen, who are experienced in working to accepted plumbing practices.**



Auspex pipe is a cross-linked polyethylene (PE-X) pipe manufactured to comply with AS 2492.

## Auspex Pipes

### Advantages of the Auspex Pipe

1. Auspex pipe 16-32mm is made in Melbourne, Australia
2. The light weight pipe does not have to be expanded or reverted to make the joint
3. Tighter manual bending
4. Corrosion resistant – no corrosion or scale build up
5. Dampens water hammer noise
6. Auspex pipe is an SDR9 with a performance of an SDR7.4, without a compromise to flow rates
7. Quiet water flow (see acoustic tables in this manual)

Installations should be carried out in accordance with accepted plumbing practices and instructions provided in this manual. However, the installer should also be aware of local authority codes and by-laws relevant to plumbing, which take precedence over these guidelines in any area where they vary.

Installation is subject to the requirements of the applicable regulatory authority, the National Construction Code Volume Three – Plumbing Code of Australia, associated reference standards as applicable at the time and AS/NZS 3500.

### Cross-Linked Polyethylene

Auspex cross-linked polyethylene is extruded as a PE-Xb pipe and manufactured using the silane or 'moisture cure' method and is made in a two-stage simple process.

1. Silane grafted polyethylene is combined with a catalyst and extruded into PE-Xb pipe
2. The cross-linking process is then performed by exposing the pipe to steam

The moisture cure process of cross-linked PE-Xb pipe enhances pipe performance properties including strength, temperature and chemical resistance, crack, creep and abrasion resistance, pipe flexibility, pressure rating, expansion and contraction.

Additionally, Auspex cross-linked polyethylene is made using a PE-X100 raw material, which combined with an SDR9 wall, provides improved flow rates and a pressure rating equivalent to an SDR7.4 pipe.

Environment

We recognise that environmental impacts are increasingly important to our stakeholders and to society more broadly. RWC actively manages its consumption of energy, water and raw materials for manufacturing and packaging to mitigate our impact on the environment.

RWC supports local and global efforts to combat climate change and strives for a sustainable low carbon future. Our efforts are aligned with the UNFCCC Paris agreement which is focused on reducing emissions to limit global warming to a 2°C increase from pre-industrial level.

Operating Parameters

Pressure and Temperature

Auspex pipe is manufactured and certified to comply with the performance requirements of AS 2492. Designed to operate with a working pressure of 2000kPa at 20°C and can be operated at 70°C with a maximum working pressure of 1000kPa (see special conditions relating to Recirculating Systems on page 12).

Temperatures above 70°C for any period will affect the life of the pipe.

Designated Auspex connections can only be used on Auspex SDR9 Pipe.

The table below represents the working pressures of cross-linked polyethylene PN20 pipe at various pipe material temperatures (PMT) as per AS 2492.

Temperature	20°C	60°C	70°C
kPa	2000	1190	1000

Fire and Excessive Heat

- Keep PE-X a minimum of 500mm from sources of high heat such as heating appliances, flues from heating appliances etc
- Keep PE-X 1500mm from slow combustion type stoves and flues used to heat hot water or cooking (wet back type)
- Leave 300mm minimum space between PE-X pipe and light fittings or other electrical fixtures
- PE-X should not be positioned within 150mm of gas or central heating vents or flues
- Where fire collars or the like are required, installers should contact the manufacturer of those products to ensure they have certification for PE-X pipes within the applied application

Uncontrolled Heat Sources

In the case of uncontrolled heat sources (e.g. slow combustion stoves, water heating coils, wet back boilers, solar, or similar) PE-X pipe should not be used. The primary flow and returns on these types of heaters should not be installed in PE-X pipe. Secondary flow and returns must be controlled so that the temperature / pressure requirements are not exceeded.

In the interest of safe temperature and to protect the user, tempering valves should be installed in accordance with AS/NZS 3500.

When using solar systems, installers should consult with manufacturers to ensure that water leaving the storage facilities does not exceed the performance capabilities of the pipe. Primary flow and returns should not be installed in Auspex pipe and secondary flow and returns must be controlled.

Direct Sunlight Exposure

Auspex black pipes manufactured after March 2010 meet the requirements of AS 2492 for carbon black content. As far as the standard is concerned relating to UV stability, the black pipe meets all of the requirements.

All Auspex coloured pipes are not to be exposed to direct or reflected UV light and must be protected.

As a conservative company, we still believe that good plumbing practice would see exposed external pipes protected.

General Installation Requirements

The pipe is manufactured in 16mm and 20mm sizes and supplied in 100m or 50m coils and 5m straight lengths. 25mm pipe is available in 25m coils and 5m straight lengths, and 32mm pipe is available in 5m straight lengths. The pipe is manufactured in accordance with AS 2492, which is far more exacting than other approved plastics materials. Because the pipe is flexible and available in coils you can often use less fittings on a job.

## Recirculating Hot Water Systems

Recirculating Hot Water Systems or Ring Mains are a good way to minimise the time it takes to get hot water to an outlet on larger installations and can reduce water consumption. It is also known that the continual flow of water and exposure to high temperatures make this a very demanding application; whether copper, PE-X, or other piping materials. If not configured correctly, the entire plumbing system may have a significantly reduced service life.

The following installation and water quality parameters must be followed on any recirculating hot water systems using the Auspex plumbing system in order to maintain the product warranty. These parameters help ensure the systems' service life and cater to performance tolerances of boilers and other heat sources.


- The maximum water temperature in the system is to be limited to 60°C
- The water pressure within the ring main must be limited to 500kPa (as per AS/NZ 3500)
- The pipe work and recirculating pumps must be sized to limit the maximum water velocity to the requirement of AS/NZS 3500 for non-metallic piping. Where copper pipe is part of the installation, the velocity restrictions for this material must be adhered to
- A timer operated recirculation pump must be used with a maximum circulation time of 12 hours per 24 hour period. It is recommended that the pipe work be insulated and that the recirculating pump also have a thermostat control, to further reduce stress on the system and minimise energy consumption
- The pipe layout should be designed to use wide sweeping bends in the pipe with minimal fittings
- Water quality conditions are typical of major Australian city potable water reticulation systems as defined in the Australian Drinking Water Guidelines

## Minimum Cold Bending Radii

Ten times the outside diameter of the pipe used.

DIAMETER	RADII
16mm	160mm
20mm	200mm
25mm	250mm
32mm	320mm

Bending of the pipe for change of direction is preferable to elbows, however fittings will be required where sharp bends are necessary. Tighter bends can be achieved by using a bend support.



Do not use pipes that have kinks, cuts, deep scratches, squashed ends, imperfections or have been in contact with grease or tar substances. Any of the above should be cut out and replaced, as these conditions may affect the integrity of the system.

## Auspex Burial

Auspex fittings are suitable for burial in most applications. Fittings installed under any permanent driveway, path or parking area should be avoided as good plumbing practice. Additionally, care is required when using fittings in applications that require burial as environmental factors may have a detrimental effect on the life expectancy of the fittings and pipe.

The installation of Auspex fittings that require burial or chasing into concrete or brickwork, must comply with all local plumbing code requirements. Auspex fittings are not suitable for use in areas where the soil is or may become contaminated\* including the soil used for back filling. It is recommended that all Auspex fittings have an impervious barrier between the fitting and the surrounding soil.

The soil used for back filling must be free of rocks, debris or any sharp objects that may cause damage to the fitting or pipe through impact or abrasion.

*\*Examples of contamination include, but are not limited to: petrochemicals (reclaimed service station sites), high levels of nitrogen compounds (this could be caused by animal waste or fertilizer that may be found in some agricultural applications), low pH levels (below pH 6), high pH levels (above pH 8), run off from land fill, formaldehyde compounds, and solvents. It should be noted that such contaminants have been known to migrate through plastic piping systems and contaminate the potable water supplied through these pipes.*

## Auspex Silicone Burial Wrap

Make an Auspex connection ensuring pipe is inserted to proper depth. While leaving the protective film in place, measure the amount of tape needed to completely wrap the fitting. To ensure a proper seal, overlap tape by 25mm past the end of the fitting on every end and 6-12mm between/across the fitting.

Wrap the fitting by pulling the tape tight and removing the protective film. Completely cover the fitting. The tape will bond to itself within minutes and will cement to itself within a few hours forming an air and water tight seal.



Silicone Burial Wrap

## Expansion and Contraction

The pipe can handle thermal expansion because of its flexibility. It should freely move through the clips, studs, plates or walls. Synthetic clips are recommended.

Care should be taken in regards to contraction. Where pipes are installed between fixed points, allow 10mm slack per metre for contraction to overcome undue pressure on the joints if contraction occurs.

### The Formula For Calculating Expansion Rates

$\Delta L$	=	$a \times L \times \Delta T$
$\Delta L$	=	linear expansion in mm
$a$	=	coefficient of linear expansion is 0.15 mm/mK
$L$	=	length of pipe in metres
$\Delta T$	=	temperature difference

The approximate expansion rate of PE-X is 7.5mm per metre in a change of temperature of 50°C.

## Thermal Expansion

The tables on page 15 represent expansion and contraction of PE-X pipe in millimetres, resulting from a given change in temperature.

The tables are calculated using the following equation:

*Change in pipe length = 0.1422 x Pipe length x Change in temperature*

		CHANGE IN TEMPERATURE (°C)							
LENGTH OF PIPE IN METRES		10	12	14	16	18	20	22	24
	1	1.4	1.7	2.0	2.3	2.6	2.8	3.1	3.4
	2	2.8	3.4	4.0	4.6	5.1	5.7	6.3	6.8
	4	5.7	6.8	8.0	9.1	10.2	11.4	12.5	13.7
	6	8.5	10.2	11.9	13.7	15.4	17.1	18.8	20.5
	8	11.4	13.7	15.9	18.2	20.5	22.8	25.0	27.3
	10	14.2	17.1	19.9	22.8	25.6	28.4	31.3	34.1
	12	17.1	20.5	23.9	27.3	30.7	34.1	37.5	41.0
	14	19.9	23.9	27.9	31.9	35.8	39.8	43.8	47.8
	16	22.8	27.3	31.9	36.4	41.0	45.5	50.1	54.6
	18	25.6	30.7	35.8	41.0	46.1	51.2	56.3	61.4
	20	28.4	34.1	39.8	45.5	51.2	56.9	62.6	68.3
	22	31.3	37.5	43.8	50.1	56.3	62.6	68.8	75.1
	24	34.1	41.0	47.8	54.6	61.4	68.3	75.1	81.9
	26	37.0	44.4	51.8	59.2	66.5	73.9	81.3	88.7
	28	39.8	47.8	55.7	63.7	71.7	79.6	87.6	95.6
	30	42.7	51.2	59.7	68.3	76.8	85.3	93.9	102.4
	32	45.5	54.6	63.7	72.8	81.9	91.0	100.1	109.2
	34	48.3	58.0	67.7	77.4	87.0	96.7	106.4	116.0
	36	51.2	61.4	71.7	81.9	92.1	102.4	112.6	122.9
	38	54.0	64.8	75.7	86.5	97.3	108.1	118.9	129.7
	40	56.9	68.3	79.6	91.0	102.4	113.8	125.1	136.5
LENGTH OF PIPE IN METRES		26	28	30	32	34	36	38	40
	1	3.7	4.0	4.3	4.6	4.8	5.1	5.4	5.7
	2	7.4	8.0	8.5	9.1	9.7	10.2	10.8	11.4
	4	14.8	15.9	17.1	18.2	19.3	20.5	21.6	22.8
	6	22.2	23.9	25.6	27.3	29.0	30.7	32.4	34.1
	8	29.6	31.9	34.1	36.4	38.7	41.0	43.2	45.5
	10	37.0	39.8	42.7	45.5	48.3	51.2	54.0	56.9
	12	44.4	47.8	51.2	54.6	58.0	61.4	64.8	68.3
	14	51.8	55.7	59.7	63.7	67.7	71.7	75.7	79.6
	16	59.2	63.7	68.3	72.8	77.4	81.9	86.5	91.0
	18	66.5	71.7	76.8	81.9	87.0	92.1	97.3	102.4
	20	73.9	79.6	85.3	91.0	96.7	102.4	108.1	113.8
	22	81.3	87.6	93.9	100.1	106.4	112.6	118.9	125.1
	24	88.7	95.6	102.4	109.2	116.0	122.9	129.7	136.5
	26	96.1	103.5	110.9	118.3	125.7	133.1	140.5	147.9
	28	103.5	111.5	119.4	127.4	135.4	143.3	151.3	159.3
	30	110.9	119.4	128.0	136.5	145.0	153.6	162.1	170.6
	32	118.3	127.4	136.5	145.6	154.7	163.8	172.9	182.0
	34	125.7	135.4	145.0	154.7	164.4	174.1	183.7	193.4
	36	133.1	143.3	153.6	163.8	174.1	184.3	194.5	204.8
	38	140.5	151.3	162.1	172.9	183.7	194.5	205.3	216.1
	40	147.9	159.3	170.6	182.0	193.4	204.8	216.1	227.5



Clipping

AS/NZS 3500 recommend the following spacings:

Diameter	Horizontal	Vertical
16mm	600mm	1200mm
20mm	700mm	1400mm
25mm	750mm	1500mm
32mm	850mm	1700mm

The above is a guide only. Good plumbing practice requires that clipping be installed so that stress is not imposed on the joint. When bending close to a joint, clips should be placed near the fitting in a manner not to stress the joint.

Timber Frames

Drill holes through studs, plates etc. large enough so that the Auspex pipe can move freely through the holes to allow for expansion and contraction and pressure surges.

To avoid noises where pipes pass through studs, plates etc. that have large holes, consideration should be given to the use of a non-aggressive compound, grommet, or sleeve in the annular space in the stud or plate.

AS/NZS 3500.1 allows neutral cure silicone to be used around PE-X pipes to fill the annular space drilled through a stud or plate.

Steel Frames

Holes drilled or formed in metal studs or plates must be accurately sized to enable suitable grommets. Insulation or a short sleeve of oversize pipe should also be firmly secured in the framework to be inserted around the pipe. This helps to ensure that there is no direct contact between the pipe and framework, and allows for free longitudinal movement of the pipe through the grommet, lagging or sleeve.

Refer to AS/NZS 3500 – 5.4.2.1(c)

Pipes in Chases, Ducts or Conduits

- Pipes in chases must be continuously wrapped with an impermeable flexible material
- Auspex supply pre-covered 5m lengths suitable for this purpose
- Ducts must be fitted with removable covers
- Conduits embedded in walls or floors should comply with the requirements of the Australian or New Zealand Building Codes as applicable

Although water service pipes are not permitted to be embedded or cast directly into a concrete structure it is permissible for a water service pipe to be within a conduit and then embedded within a wall or floor of masonry or concrete construction.

Refer to AS/NZS 3500.1 – 5.4.3

Under Concrete Slabs

Water pipes located beneath slabs on ground must be laid on a compacted bed of sand or fine-grained soil with a minimum distance of 75mm between the top of the underside of the slab. Pipe work that penetrates the slab must be at right angles to the slab surface and lagged the full length of the slab penetration with an impermeable flexible material not less than 6mm in thickness. Alternatively, an impermeable plastic sleeves or conduit providing equivalent protection.

Any joints located beneath a concrete slab should be kept to a minimum and fitting protection applied.

Refer to Auspex Burial (page 13)

Water Quality and Chlorine

Potable water is sourced using a variety of methods. The Australian Drinking Water Guidelines provides a framework to govern potable water. To achieve this, chlorine and other agents are sometimes used as constituents of the water or for commission purposes.

The Auspex plumbing system is compliant and certified to AS/NZS 2537 and AS 2492 and as such all components of the system have been certified to AS/NZS 4020. RWC can confirm, based on the AS/NZS 4020 certification that the Auspex system does not cause any multiplication of micro-organisms, microbial contamination, or legionella growth.

RWC recommend that an independently accredited provider is engaged to undertake any chemical flush of the system and that this work is carried out in line with the relevant Standards.

Chemical flushing is to be done in line with the Australian Drinking Water Guidelines. The guidelines prohibit flushing potable plumbing systems with a solution greater than 5ppm of chlorine and within the normal operating temperatures and pressures (as specified in the Auspex Technical Literature).

If chemical flushing with a high concentration solution of chlorine is conducted incorrectly it will have a detrimental effect on any piping system. Dosing must be done in such a way as not to exceed the 5ppm chlorine level in any part of the plumbing system.

## Auspex Pipe Colours

Auspex pipe is made in a range of various colours to identify the particular purpose of use and are all manufactured to comply with AS 2492.



### Black Pipe

Black Pipe is typically used for Potable Water but can also be used for hot water installations.



### Red Pipe

Red Pipe is for hot water applications only.



### Purple Pipe

Purple Pipe is coloured and branded specifically for Recycled Water applications.



### Green Pipe

GreenPipe is available for rainwater applications.

## Precautions

### Chemicals

Always check with RWC before using Auspex pipe for applications other than for potable water. Additionally, check with RWC if pipework is to be installed in a known contaminated area, in contaminated soils or where chemical spills may have occurred.

### Electrical

It is of the utmost importance that if a metallic pipe is being installed or replaced, by a plastic pipe or other non-metallic fittings or couplings, the requirements of AS/NZS 3500 must be followed.

Additionally, copper tube connected to a Auspex fitting does not guarantee electrical continuity.

No work should be carried out until the earth requirements have been checked by an electrical contractor and modified if necessary.

## PE-X Dimensions

Auspex pipe sizes are manufactured within tighter tolerances of AS 2492 as indicated below.

Nominal Size	Tube OD (mm)	Tube Wall (mm)	Tube ID (mm)
DN16	16.0-16.3	2.0-2.3	11.4-12.3
DN20	20.0-20.3	2.3-2.7	14.6-15.7
DN25	25.0-25.3	2.8-3.2	18.6-19.7
DN32	32.0-32.3	3.6-4.1	23.8-25.1

## Thermal Conductivity

R-Values of Common Plumbing Piping and Insulation. In certain areas, AS/NZS 3500 requires a minimum insulation of R=0.3. No current piping material will meet this requirement without suitable thermal insulation.

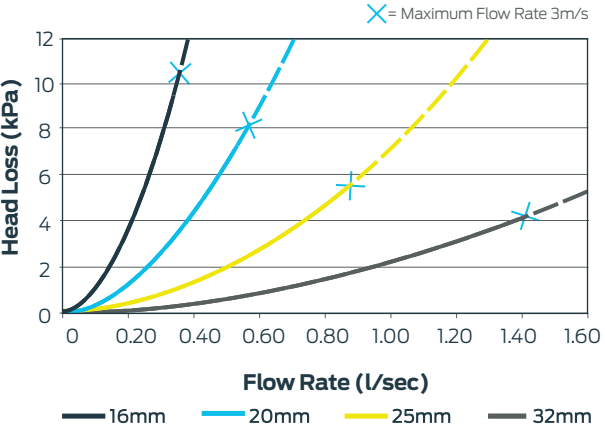
*"R-value = Thickness / Conductivity. See AS/NZS 3500.4 Section 8.6"*

	Conductivity (K) W/M/K	OD (mm)	ID (mm)	Wall Thickness (mm)	R-Value K.M <sup>2</sup> / W
Air	0.02	-	-	6	0.300
Copper DN15	401	12.7	10.88	.91	-0.0000023
Lagged Copper (Approx.)	Cu + Air + Plastic	-	-	~2	0.034
Auspex Pipe 16mm	0.35	16	11.6	2.2	0.006
Auspex Pipe 20mm	0.35	20	15.1	2.45	0.007
Auspex Pipe 25mm	0.35	25	18.6	3.2	0.009
Auspex Pipe 32mm	0.35	32	24.2	3.9	0.011
E-Therm™	0.034	-	-	8	0.235
Requirement of AS/NZS 3500.1 5.19 DN15	0.03	-	-	9	0.300
Requirement of AS/NZS 3500.4 2003 Amendment 1 2005 (Table 8.1 & 8.2)	0.0433	-	-	13	0.300

Pressure or Head Loss Through PE-X Pipe

This graph shows pressure loss through Auspex Pipe at various flow rates in 16mm and 20mm.

In order to calculate the pressure loss through the pipe, the given flow rate for a particular portion of tube must be established (this may be done using the table provided in AS/NZS 3500), along with the required pipe length and diameter. The pressure loss can then be read off the vertical axis.



Information provided here is theoretical and based on new clean pipe. No allowance has been made for age or any abnormal conditions of the interior surface of the pipe.

Maximum Flow Rates

Size	16mm	20mm	25mm	32mm
Min ID (mm)	11.9	15.05	19.3	24.5
Max Flow (L/min)*	20.0	32.0	52.7	84.9
Max Flow (L/sec)*	0.33	0.53	0.88	1.41

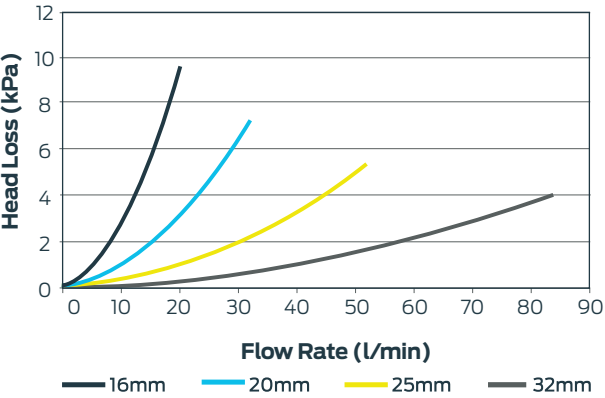
\*Based on AS/NZS 3500 maximum allowable velocity in pipe of 3m/s.

Based on its minimum ID of 15mm, 20mm Auspex may be used where AS/NZS 3500 requires a nominal pipe size of DN20 (eg. Section 3.5.1). This is a feature of Auspex pipe only, and not generally applicable to PE-X pipe.

Pipe Flow Characteristics

Flow Rate (l/min) vs Head Loss (kPa)

	Pipe Size	Flow Rate (l/min)				
		4	20	40	60	80
Head Loss per metre of pipe (kPa)	16mm	0.49	9.54	-	-	-
	20mm	0.15	3.04	-	-	-
	25mm	0.05	0.91	3.27	-	-
	32mm	0.01	0.40	1.02	2.17	3.69



Information provided here is theoretical and based on new clean pipe. No allowance has been made for age or any abnormal conditions of the interior surface of the pipe.

Flow Velocity (m/sec)	Flow Rate (l/min)			
	16mm	20mm	25mm	32mm
1.0m/s	6.7	10.7	17.6	28.3
2.0m/s	13.3	21.3	35.1	56.6
3.0m/s	20.0	32.0	52.7	84.9

Acoustic Tests

Results Summary

- The noise emitted by the pipes through the wall was mainly evident in the mid to high frequencies of the A-weighted spectrum
- Noise emitted at frequencies below 250Hz was affected by the level of background noise in the room
- The change in radiated noise level was greater with the change in water flow compared with the change in water pressure
- In all cases the overall noise level emitted by the Auspex pipe was less than for the copper pipe. For the same flow conditions the differences in overall noise level between the pipes was between 14 and 17dB(A)

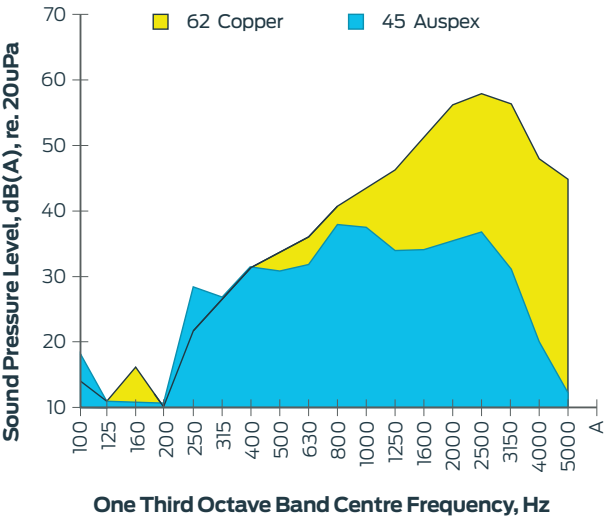
Conclusion

Measurements of noise were taken from pipe attached to the other side of a concrete block wall, with water flowing through and a noise source in the pipe.

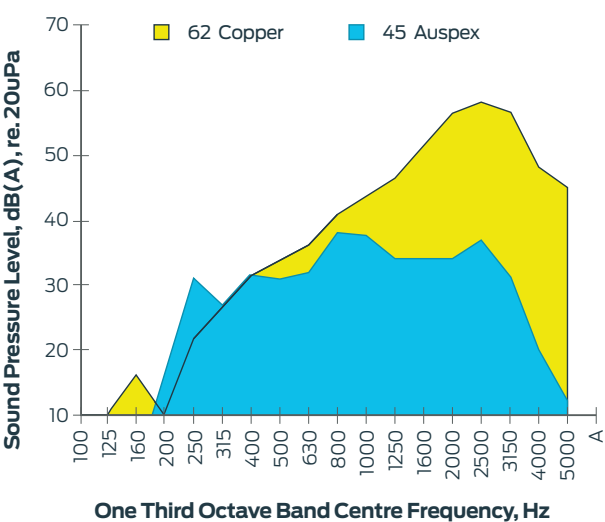
The measured noise emitted from nominal 15mm bore pipes showed that the Auspex cross-linked polyethylene pipe was between 14 and 17dB(A) quieter than the standard copper pipe.

Waterflow l/min	Water Pressure kPa	Measured Noise Level dB(A)		Difference dB(A)
		Auspex	Copper	Copper – Auspex
15	300	38	55	17
15	600	40	54	14
20	600	45	62	17
20	700	45	62	17

Measured noise level of water flow through nominal 15mm bore Auspex and copper pipe, 20L/min, 600kPa with DIN 52218 noise source.



Measured noise level of water flow through nominal 15mm bore Auspex and copper pipe, 20L/min, 700kPa with DIN 52218 noise source.



# Auspex Stainless Steel Range

## Austenitic Stainless Steel

Austenitic stainless steel has been identified as a suitable, cost-effective material for problem environments, primarily in applications where more aggressive water sources are present.

This series is known for its excellent corrosion resistance to a wide variety of chemicals and water sources. Its microstructural characteristics also provide a unique combination of strength and toughness for the material's service life.

## Alloy Designation

British Standard EN10088-1 (2005): [X5CrNiMo17-12-2]  
– Refer Table 4, alloy code 1.4401

Alloy Equivalents in ASTM cast series and  
AISI/UNS wrought series:

- ASTM – [CF-8M]
- AISI – [Type 316]
- UNS – [C31600]

## Chemical Composition (Cast Analysis)

C	Si	Mn	P max	S	N
0.07	1.00	2.00	2.00	0.015	0.11
Cr	Cu	Mo	Nb	Ni	Fe
16.50 to 18.50	–	2.00 to 2.50	–	10.00 to 13.00	REM

The British standard alloy designation 1.4401 [X5CrNiMo17-12-2] is used to describe the specific chemical composition chosen for this series of Auspex fittings.

This type of alloy is classified as a corrosion resistant cast steel that has a good resistance to both uniform and local attack which is provided by the Chromium (Cr) content in the alloy. The Cr spontaneously forms a protective oxide film which acts as a barrier to corrosion and is the base protective mechanism of stainless steel.

In addition to this, Molybdenum (Mo) is also included in the composition for increased resistance to crevice corrosion and pitting in chloride-containing environments (as found in many aggressive water sources).

These fittings will consist of ~5-20% Ferrite distributed in discontinuous pools throughout an Austenite matrix which provides a unique combination of properties appropriate for use in various potable water applications.

The Austenite phase (FCC crystal structure) possesses excellent ductility, formability and has a high fracture toughness. The presence of Ferrite (BCC crystal structure) in the alloy is beneficial for resistance to stress corrosion cracking (SCC) and intergranular attack.

In the case of SCC, the Ferrite blocks crack propagation through the Austenite matrix. It also promotes resistance to intergranular cracking by preferentially precipitating carbides along its grain boundaries, rather than along the Austenite grain boundaries, where they would increase susceptibility to intergranular attack.

The presence of Ferrite is also beneficial to the tensile and yield strength of the alloy without any significant reduction in toughness. As the ~5-20% Ferrite is magnetic (Austenite is not), there will be a low magnetic response from this alloy.

## Reverse Osmosis (RO Water)

Reverse osmosis (RO) is a water purification process that removes all the contaminants including minerals from the drinking water supply.

The Auspex Stainless Steel range of fittings is suitable for RO water applications however the DZR brass range of fittings must not be used for such applications.

All relevant system guidelines as presented in the Auspex Technical Manual apply to the use of Stainless Steel fittings for RO applications.





# Installation Instructions

Auspex fittings from 16-25mm use a copper crimp ring connection and can be crimped with an Auspex manual tool or a Rothenburger battery tool.

It is most important that the tool manual supplied with the tool is read in its entirety and the user becomes familiar with the maintenance, calibration and proper use of the tool.

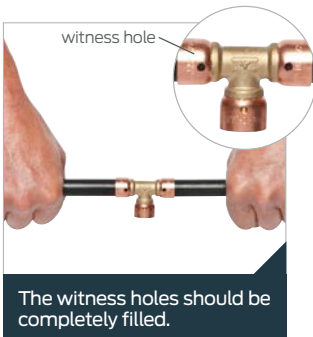
## Step 1.

Measure the pipe to the correct length and using a secateur-type pipe cutter, cut the pipe squarely and remove any burrs. The end of the pipe may need to be freshly cut to ensure smooth passage for the fitting. **Do not use a hacksaw.**



## Step 2.

The pipe is pushed over the barbed fitting and at the same time under the crimp ring. The fit should be firm. If the joint feels sloppy or hard to insert, check pipe and fittings. Do not use lubricants. Ensure the pipe is visible in both crimp ring witness holes.



## Step 3.

**Make sure the tool jaws are centralised over the crimp ring at 90° to the joint.**

When using the manual tool, close the tool completely to compress the crimp ring. The tool will click at final compression.



When using a battery tool, ensure the tool has fully closed and released indicating a completed joint.

## Step 4.

For manual tool use, regularly check with the gauge supplied by sliding the opening of the gauge over the compressed ring. If the gauge passes over all parts of the ring without interference, then the joint has been crimped satisfactorily.

Correctly serviced battery tools do not require a gauge check if the joint has been completed as per instructions.



If the gauge experiences any interference, the joint is under crimped. The tool should then be adjusted. (See adjustment instructions in this manual). **Do not double crimp.**

## Step 5.

Pressure test the system in accordance with AS/NZS 3500 and with local requirements.

Design the installation in such a way as to not stress the system joints, bend supports may be required.

## 32mm Joints

When crimping Auspex 32mm, use the battery tool with a 32mm DuoPEX Jaw. Place the fitting inside the jaws so that the raised section of the plastic sight ring fits into the slot in the jaws. Release the jaws so they fit perfectly over the fitting, ensuring that the raised section of the plastic sight ring is still located in the slots in the jaw.

Press the switch mechanism until the joint is completed. Press the back end of the jaws and remove the completed joint.



# General Installation Tips

## The Gauge

The gauge is one of the quality controls of the system. It verifies firstly that the ring has been crimped and secondly, that it has been compressed enough.

Gauging of the compressed ring should be done regularly throughout each job.

When using the gauge, slide the opening over the compressed ring. If the gauge passes over all parts of the ring without interference then the joint has been done satisfactorily. Do not place the gauge over the pipe and then move it back along the pipe and over the ring. This may not give a true reading.

If the gauge experiences any interference the joint is under crimped. The tool should then be adjusted. **DO NOT DOUBLE CRIMP.**

If the gauge is lost, it should be replaced immediately.

## LDPE Holding Ring

The plastic ring on the 16-25mm fittings are only there to hold the crimp ring to the fitting. It plays no part in the integrity of the joint. It may behave differently after crimping, however as a general rule, the back of this ring should be flush against the body of the fitting and the crimp ring should be attached to it. This starting position will also help to ensure full penetration of the fitting inside the pipe.

For Mark II fittings where the crimp ring is held in place without the plastic ring, the tool jaws must be aligned to the end of the crimp ring where the pipe enters the fitting.

## The Pipe

The pipe that comes out of the crimped ring at an angle may indicate that the pipe is not covering all of the barbs on one side. This situation may occur if a tight bend is made close to a joint or if the pipe has moved in some way prior to crimping. Where possible, crimp the fitting before making the tight bend and install a clip close to the joint between the bend and the joint. Use a bend stabiliser to avoid stress on the joint.

## Coloured Plastic Rings

The Auspex crimp system has a range of adaptors, which are identified by a different coloured plastic ring. Do not join Auspex pipe by using a fitting with a coloured ring. To identify the uses for these adaptors, consult your supplier or Auspex directly.

The 32mm Auspex water fitting has a Stainless Steel crimp ring and can only be crimped with the battery tool using a DuoPEX jaw. The DuoPEX jaws are universal across all systems shown below.



**DuoPEX Gas** fittings are defined by the yellow plastic holding ring and are for use only with the multi-layer DuoPEX Gas pipe.



**DuoPEX Water** fittings are defined by the blue plastic holding ring and are for use only with the multi-layer DuoPEX Water pipe.



**Auspex Water 32mm** fittings are defined by the clear plastic holding ring and are for use only with the single layer Auspex water pipe and multi-layer Auspex Gas pipe.

## Pinched Ring

When crimping fittings which are flush to frames etc, check to ensure that the crimp ring has not pinched on the back side. Rings which are pinched in this manner should be replaced.

## Clips

The clips should be installed so that the pipe can move freely through the clip. Plastic clips are recommended.

## Tooling

Only Auspex approved tooling can be used with the Auspex system. Manual hand crimpers are available for 16mm, 20mm, and 25mm. Auspex and Rothenberger battery tools with approved jaw sets are also available, 16-32mm.

# Crimping Tool

## Adjustment of Tool

1. With the tool open, apply light pressure inwards.
2. The handle should be positioned somewhere between 225-250mm apart.
3. If adjustment is required, back off locking screw 3-4 full turns.
4. Turn adjusting screw in ¼ turn increments, adjusting screw slot should finish in a vertical or horizontal position.
5. Recheck opening of handle measurement.
6. When set, tighten down locking screw.
7. Conduct a crimp and gauge check. Re-adjust tool if crimp not satisfactory.

## Ratcheting

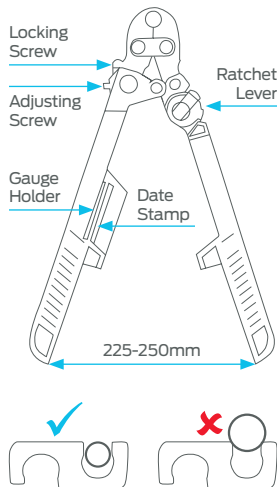
Move Ratchet Lever up or down to suit movement.

## Nominal Adjustment

225-250mm.

## Gauge

Ensure crimped connection passes through gauge opening on all sides of the joint.



# Joining To Other Materials

Threaded fittings are available to make the transition between PE-X pipe and other materials. Specialised and tested adaptor fittings are also available. Please see catalogue or contact Auspex.

## When Joining To Copper

- a. Flared copper compression to Auspex crimp adaptors are available.
- b. Brazing adaptors are available, designed so that one end can:
  - Fit over 15mm, 20mm, 25mm and 32mm copper pipe
  - Fit into expanded 15mm, 20mm or 25mm copper pipe
  - Fit into standard copper or brass brazed fittings
  - When brazing these adaptors they **MUST** be cold before inserting into the PE-X pipe
- c. Push fit copper adaptors are available:
  1. Square cut the copper pipe
  2. Remove any burrs or loose material
  3. Ensure the outside of the pipe is free of scratches, marks etc.
  4. Push the copper fully into the fitting using a twisting motion
  5. Make sure the copper is not oval or out of round
  6. Do not use on annealed copper or coated copper e.g. chrome coating
- d. B-Press (crimp) copper to Auspex:
  1. See catalogue for available conversion fittings
  2. Follow the B-Press installation instruction for the copper crimp end
  3. Follow the Auspex installation instruction for crimping the PE-X end of the fitting



## IMPORTANT

- A tool that is out of adjustment can cause a faulty joint
- A tool that is set with excessive pressure can damage both tool and fitting
- A worn or damaged tool should be replaced

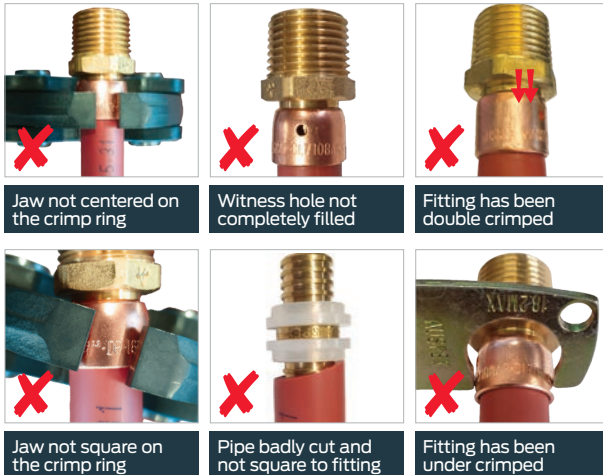
## Troubleshooting

The Auspex crimp system is simple and effective when executed in accordance with the jointing procedures in this manual. However, if sufficient care is not taken, this can result in an ineffective joint.

### Ineffective joints may occur if:

- The crimping tool has not been completely closed
- The crimping tool is out of adjustment. Re-adjust tool in accordance with the instructions supplied with the tool, and in this manual
- The copper ring has moved away from the fitting body
- The crimping tool has not been centred over the copper ring and the jaw has overhung the end of the fitting
- The crimping tool has not been at 90° to the joint being made
- The pipe has been cut badly out of square
- The witness hole is not completely filled (the fitting is not fully inserted in the pipe)
- The fitting has been double crimped

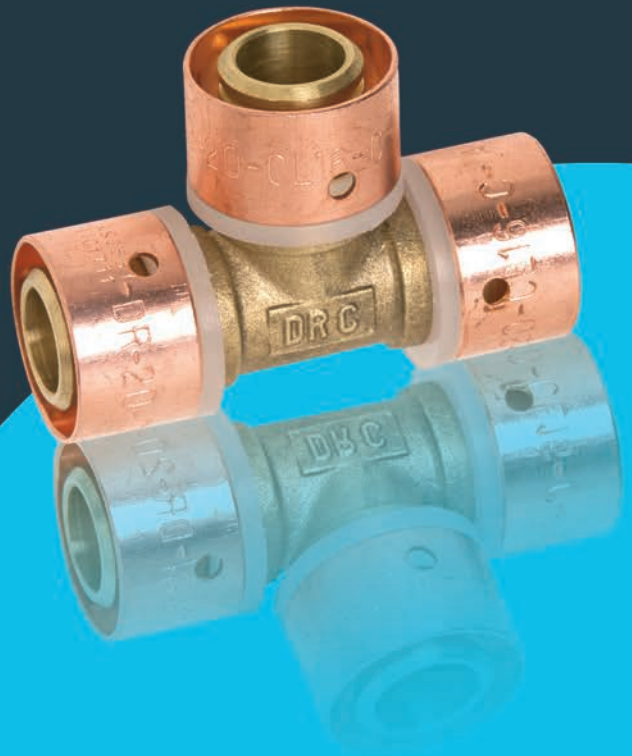
### Examples of ineffective joints:



### If an ineffective joint is detected:

- Cut out the defective joint and replace with new fitting
- Non-compliant fittings that are removed cannot be re-used.

## Product List Pipes & Fittings



# Product List

## Pipe

### Black Pipe

16mm x 5m Straight	XAP401605
16mm x 50m Coil	XAP401650
16mm x 100m Coil	XAP4016100
20mm x 5m Straight	XAP412005
20mm x 50m Coil	XAP412050
20mm x 100m Coil	XAP4120100
25mm x 5m Straight	XAP422505
25mm x 25m Coil	XAP422525
32mm x 5m Straight	XAP433205

### Black Pipe – Pre-Lagged

16mm x 5m	XAP401605LAG
20mm x 5m	XAP412005LAG

### Corrugated Sleeveing

16mm x 25m Coil	XAP401625COR
20mm x 25m Coil	XAP412025COR
20mm x 25m Coil	XAP412025COR32
32m Corr	

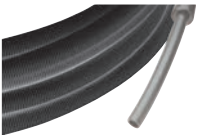
### Purple Pipe\*

16mm x 5m Straight	XAP401605LIL
16mm x 50m Coil	XAP401650LIL
20mm x 5m Straight	XAP412005LIL
20mm x 50m Coil	XAP412050LIL
25mm x 5m Straight	XAP422505LIL
25mm x 25m Coil	XAP422525LIL

\*Purple Pipe for recycled water. Marked in accordance with Australian Standards.

### Green Pipe

16mm x 5m Straight	XAP401605G
16mm x 50m Coil	XAP401650G
20mm x 5m Straight	XAP412005G
20mm x 50m Coil	XAP412050G
DuoPEX Water	DPW433205GRLAG
32mm x 5m Sleeved	



# Product List

## Pipe

### Red Pipe

16mm x 5m Straight	XAP401605R
16mm x 50m Coil	XAP401650R
20mm x 5m Straight	XAP412005R
20mm x 50m Coil	XAP412050R
25mm x 5m Straight	XAP422505R
25mm x 25m Coil	XAP422550R

### Red Pipe – Pre-Insulated

16mm x 25m Coil R.3 – 9mm Wall	XAP401625RR3
16mm x 25m Coil R.8 – 13mm Wall	XAP401625RR8
20mm x 25m Coil R.3 – 9mm Wall	XAP412025RR3
20mm x 25m Coil R.8 – 13mm Wall	XAP412025RR8
25mm x 25m Coil R.3 – 9mm Wall	XAP422525RR3
25mm x 25m Coil R.8 – 13mm Wall	XAP422525RR8





# Product List

## Fittings

16 – 25mm with copper rings and 32mm with stainless steel rings. 32mm fittings must be crimped with the battery tool using the 32mm DuoPEX jaw.

### Couplings

16mm x 16mm	AP011616
20mm x 20mm	AP012020
25mm x 25mm	AP012525
32mm x 32mm	AP013232
20mm x 16mm	AP022016
25mm x 20mm	AP022520
25mm x 16mm	AP022516
32mm x 20mm	AP023220
32mm x 25mm	AP023225



### Tees

16mm x 16mm x 16mm	AP03161616
20mm x 20mm x 20mm	AP03202020
25mm x 25mm x 25mm	AP03252525
32mm x 32mm x 32mm	AP03323232
20mm x 20mm x 16mm	AP04202016
20mm x 16mm x 16mm	AP04201616
20mm x 20mm x 25mm	AP04202025
20mm x 16mm x 20mm	AP04201620
25mm x 16mm x 16mm	AP04251616
25mm x 16mm x 20mm	AP04251620
25mm x 16mm x 25mm	AP04251625
25mm x 20mm x 16mm	AP04252016
25mm x 20mm x 20mm	AP04252020
25mm x 20mm x 25mm	AP04252025
25mm x 25mm x 16mm	AP04252516
25mm x 25mm x 20mm	AP04252520
16mm x 16mm x 20mm	AP04161620
32mm x 32mm x 25mm	AP04323225
32mm x 32mm x 20mm	AP04323220
32mm x 25mm x 25mm	AP04322525
32mm x 20mm x 20mm	AP04322020
20mm x 20mm x 1/2"	AP04202015F



### Tees for Brazing Copper Pipe

16mm x 16mm x 1/2"	AP04161608F
20mm x 20mm x 3/4"	AP04202008F



# Product List

## Fittings

### Elbows

16mm x 16mm	AP051616
20mm x 20mm	AP052020
25mm x 25mm	AP052525
32mm x 32mm	AP053232
25mm x 20mm	AP052520
20mm x 16mm	AP052016
16mm x 1/2" Male	AP051615
20mm x 1/2" Male	AP052015
25mm x 1" Male	AP052525M
32mm x 1" Male	AP053225M



### Lugged Elbow (Male)

16mm x 1/2" (73mm)	AP061615S
16mm x 1/2" (88mm)	AP061615L
16mm x 1/2" (100mm)	AP061615100
16mm x 1/2" (200mm)	AP061615200
16mm x 1/2" (230mm)	AP061615230
16mm x 1/2" (88mm) Flange and Locking Nut	AP06161588
20mm x 1/2" (65mm)	AP062015
20mm x 1/2" (200mm)	AP062015200
20mm x 3/4" (200mm)	AP062020200
25mm x 3/4" (75mm)	AP06252075M
16mm x 5/8" (200m) Recycled Water	AP0658200REC
20mm x 1/2" (95m)	AP06201595



### Lugged Elbow (Female)

16mm x 1/2" BSP	AP071615F
20mm x 3/4" BSP	AP072020F



### Brazing Tails

16mm Male	AP0816M
20mm x 15mm Male	AP082015M
20mm Male	AP0820M
25mm Male	AP0825M
32mm Male	AP0832M
25mm x 20mm Male	AP082520M
16mm Female	AP0816F
20mm Female	AP0820F
25mm Female	AP0825F
32mm Female Brazing Tail	AP0832F
20mm x 15mm Female	AP082015F



# Product List

## Fittings

### Push Fit Copper Adaptors

16mm x 15mm Push Fit	AP271615
20mm x 20mm Push Fit	AP272020
25mm x 25mm Push Fit	AP272525

### Compression Adaptors

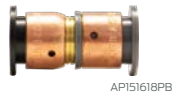
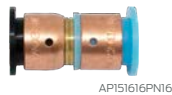
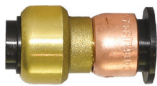
16mm x 15mm Copper	AP131615
20mm x 15mm Copper	AP132015
20mm x 20mm Copper	AP132020
25mm x 25mm Copper	AP132525

### B-Press Adaptors

16mm x 15mm Copper	AP281615
20mm x 20mm Copper	AP282020
25mm x 25mm Copper	AP282525

### System Adaptors

16mm Auspex x 16mm SDR 7.4 PE-X Adaptor	AP151620
20mm Auspex x 20mm SDR 7.4 PE-X Adaptor	AP152020
16mm SDR 7.4 PE-X x 16mm SDR 7.4 PE-X x 16mm Auspex Tee	AP151616PN20
20mm SDR 7.4 PE-X x 20mm SDR 7.4 PE-X x 20mm Auspex Tee	AP152020PN20
16mm Auspex x 16mm SDR9 PE-X Adaptor	AP151616PN16
20mm Auspex x 20mm SDR9 PE-X Adaptor	AP152020PN16
16mm Auspex x 18mm PB Adaptor	AP151618PB
18mm PB x 18mm PB x 16mm Auspex Tee	AP15181816PB
22mm PB x 20mm Auspex Adaptor	AP152022PFPB
22mm PB x 22mm PB x 20mm Auspex Tee	AP15222220PFPB



# Product List

## Fittings

### Threaded BSP Adaptors (Male)

16mm x 1/2"	AP091615
20mm x 3/4"	AP092020
25mm x 1"	AP092525
32mm x 1 1/4"	AP093232
20mm x 1/2"	AP092015
25mm x 3/4"	AP092520
20mm x 1"	AP092025
32mm x 1"	AP093225



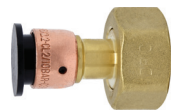
### Threaded BSP Adaptors (Female)

16mm x 1/2"	API01615
20mm x 3/4"	API02020
25mm x 1"	API02525
32mm x 1 1/4"	API03232
20mm x 1/2"	API02015
25mm x 3/4"	API02520
32mm x 1"	API03225
16mm x 1/2" Wing Back Connector	API01615WB
20mm x 3/4" Wing Back Connector	API02020WB



### Loose Nut and Tail (Female)

16mm x 1/2" Coupling	AP191615
16mm x 1/2" Elbow	AP051615F
20mm x 1/2" Coupling	AP191620
20mm x 3/4" Coupling	AP192020
20mm x 3/4" Elbow	AP052020F
25mm x 1" Coupling	AP192525



### End Caps

16mm	AP1416
20mm	AP1420
25mm	AP1425
32mm	AP1432



### Spare Copper Rings (With Plastic Inserts)

16mm	AP2216
20mm	AP2220
25mm	AP2225



# Product List

## Fittings

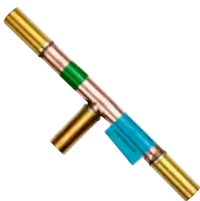
### Sink Sets

200mm Right Angle Centre	API1200RA
200mm Right Angle Centre 43.6mm Body Height	API1200RA/Q
300mm Right Angle Centre	API11RA
200mm Side Entry Centre	API1200SE
300mm Side Entry Centre	API11SE



### Shower Sets

150mm Bottom Entry Shower Set Centres, Short Copper Riser and Auspex Barb	API2BEC
200mm Bottom Entry Shower Set Centres Short Copper Riser and Auspex Barb	API2200BEC
200mm Bottom Entry Shower Set Centres with Copper Riser and Lugged Elbow	API2200BER
200mm Bottom Entry Bath/Shower Centres with Copper Riser and Lugged Elbow	API6BS200BER
200mm Bottom Entry Shower Breech Centre with 43.6mm Body Height	API2200BEC/Q
150mm Top Entry Shower Set Centres Short Copper Riser and Auspex Barb	API2TEC
200mm Top Entry Shower Set Centres Short Copper Riser and Auspex Barb	API2200TEC
200mm Top Entry Shower Set Centres with Copper Riser and Lugged Elbow	API2200TER
200mm Top Entry Shower Breech Centre with 43.6mm Body Height	API2200TEC/Q
150mm Side Entry Shower Set Centres Short Copper Riser and Auspex Barb	API2SEC
Vertical Shower Breech Left Hand Entry	API2150LH
Vertical Shower Breech Right Hand Entry	API2150RH
Single Bollard Breech	API6BBS
Double Bollard Breech	API6BBD



# Product List

## Fittings

### Manifolds

3 Port – Open End 16-20mm x 20mm	AP042020163
3 Port – Closed End 16-20mm	AP0420X163
4 Port – Open End 16-20mm x 20mm	AP042020164
4 Port – Closed End 16-20mm	AP0420X164



### Ball Valves

16mm x 16mm	AP601616
20mm x 20mm	AP602020
25mm x 25mm	AP602525
16mm x 15mm Female BSP	AP611615FI
20mm x 20mm Female BSP	AP612020FI
25mm x 25mm Female BSP	AP612525FI



### Crimping Tools

16mm	AP2116RN
20mm	AP2120RN
25mm	AP2125RN



### Crimp Ring Repair Tool

20mm x 25mm x 16mm	AP22252016
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### Gauges

20mm x 16mm	API72016
25mm	API725



### Bend Stabilisers

16mm	API816
20mm	API820



All stainless steel fittings made from grade 316 stainless steel.

Coupling

16mm x 16mm	APSS011616
20mm x 20mm	APSS012020
25mm x 25mm	APSS012525
20mm x 16mm	APSS022016
25mm x 20mm	APSS022520



Tee

16mm x 16mm x 16mm	APSS03161616
20mm x 20mm x 20mm	APSS03202020
25mm x 25mm x 25mm	APSS03252525
20mm x 16mm x 16mm	APSS04201616
20mm x 20mm x 16mm	APSS04202016
20mm x 16mm x 20mm	APSS04201620
25mm x 25mm x 20mm	APSS04252520



Elbow

16mm x 16mm	APSS051616
20mm x 20mm	APSS052020
20mm x 16mm	APSS052016
25mm x 25mm	APSS052525



Lugged Elbow (Male)

16mm x 1/2" (73mm)	APSS061615S
16mm x 1/2" (100mm)	APSS061615100



Lugged Elbow (Female)

16mm x 1/2" Female BSP	APSS071615F
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Brazing Tail

16mm Female	APSS0816F
20mm Female	APSS0820F



Threaded BSP Adaptors (Male)

16mm x 1/2" Male BSP	APSS091615
20mm x 3/4" Male BSP	APSS092020
25mm x 1" Male BSP	APSS092525



Threaded BSP Adaptors (Female)

16mm x 1/2" Female BSP	APSS101615
20mm x 3/4" Female BSP	APSS102020
25mm x 1" Female BSP	APSS102525



Sink Sets

300mm Right Angle Centre	APSS11IRA
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Shower Sets

150mm Bottom Entry Centre	APSS12BEC
150mm Top Entry Centre	APSS12TEC



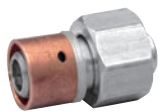
End Cap

16mm	APSS1416
20mm	APSS1420



Loose Nut and Tail

16mm x 1/2"	APSS191615
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System Adaptors

18mm PB x 16mm AP Adaptor Coupling	APSS151618PB
22mm PB x 20mm AP Adaptor Coupling	APSS152022PB
18mm PB x 18mm PB x 16mm AP Adaptor Tee	APSS15181816PB
22mm PB x 22mm PB x 20mm AP Adaptor Tee	APSS15222220PB
16mm AP x 16mm SDR 7.4 PE-X Coupling	APSS151620
20mm AP x 20mm SDR 7.4 PE-X Coupling	APSS152020
16mm x 16mm x 16mm SDR 7.4 PE-X Tee	APSS15161616PN20
20mm x 20mm x 20mm SDR 7.4 PE-X Tee	APSS15202020PN20



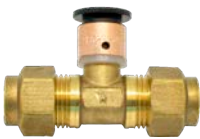


# Product List

## NZ Fittings

### Tees

½" x ½" x 16mm NZ Cu	APNZ041416CX
¾" x ¾" x 20mm NZ Cu	APNZ042120CX



### Elbows

16mm x ½" Loose Nut	AP051615NZ
20mm x ¾" Loose Nut	AP052020NZ



### Double Lugged Elbows

16mm x ½" Female	AP071615FNZ
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### Push Fit Copper Adaptors

16mm x 15mm Push Fit	AP271615NZ
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### Threaded BSP Adaptors (Male)

16mm x ½" Copper MI	AP091615NZ
20mm x ¾" Copper MI	AP092020NZ
16mm x ¾" MI	AP091620NZ



### Loose Nut and Tails (Female)

16mm x ½" Coupling	AP191615
16mm x ½" Elbow	AP051615F
16mm x ¾" Coupling	AP191620
20mm x ¾" Coupling	AP192020
20mm x ¾" Elbow	AP052020F
25mm x 1" Coupling	AP192525





## Notes

## Notes



## Customer Service

Telephone (03) 9770 3600  
Facsimile (03) 9768 3415  
Email [salesauspex@rmc.com.au](mailto:salesauspex@rmc.com.au)

[auspex.com.au](http://auspex.com.au)

For operating parameters outside those stated in the manual, please contact Customer Service.

Contents of this brochure are subject to change, please visit our website for the most up-to-date product information.

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AS/NZS 2537  
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WMKA 1711.3  
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