

Product Information Report

Industrial Hose: Multipurpose Air and Water Hose



Overview

Air and Water Hose is primarily used to either provide air to power tools such as grinders, sanders and jackhammers, or to provide water to washdown equipment such as cement mixers, and to provide water for mixtures.

Hoses in this Category

General-Purpose

- Bosflex Air and Water
- Industrial Air and Water
- Perfection 300
- Horizon® 200
- Horizon® 300
- F5™
- Gorilla®

Air

- Contractors Air
- Concord Yellow Jack
- Boston Bulldog Gold

Push-On

- Insta-Grip™ 250

Cleaning Equipment

- Neptune™ 1500
- Neptune™ 3000
- Whitewater®

Applications

- Pneumatic tools on production line
- Snubber hoses
- Provide power to air-operated construction equipment (bull lines, jackhammers, etc.)
- Power air-operated drills, boring and mining equipment
- Water transfer and washdown
- Low pressure water transfer
- Agriculture
- Assembly/Manufacturers
- Construction
- Food Industry
- Metalworking
- Mining
- Oil Industry
- Paper/Pulp
- Ship Building
- Forest Industry
- Oil Field Equipment
- Drilling Equipment
- Landscaping/Lawn Care Services

Choosing a Hose

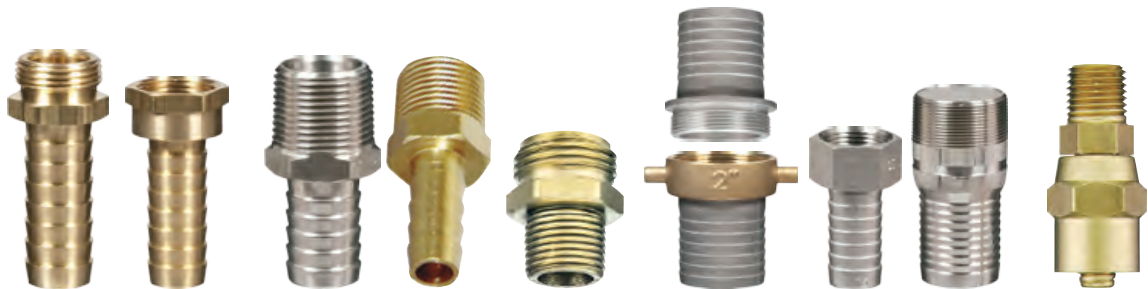
When choosing a hose it is important to look at all of the aspects of the application: **size**, **temperature**, **application**, **material**, **pressure**, **ends** and **delivery**. This is the reason there are multiple hoses in a category. Each hose has its own unique features and advantages that are described on the following pages. These features, along with working pressure, determine if the hose is acceptable to use in an application.

The information contained in this Product Information Report is to be used for recommendation purposes only. Please contact Lawson Engineering to discuss compatibility, pressures, temperatures, end fitting selection and assembly procedures.

Industrial Hose Couplings



Industrial Hose Coupling	Cam and Groove	Interlocking Inserts	Steel Nipple	Quick Acting	Combination Nipples
Service	Low and medium pressure water, petroleum and chemical transfer where fast connections are needed; also used for suction service	High pressure air and water service, steam, high pressure spray and LPG service	Medium to high pressure	Low to medium pressure; air, water or oil service where frequent and fast connections must be made	Low or medium pressure suction and discharge of water, fluids and material handling
Size Range	1/2" to 8"	1/4" to 6"	1/4" to 1"	1/4" to 2"	1/2" to 12"
Description	Aluminum, bronze, stainless steel, Monel®, malleable iron; washer seal with no threads	Plated malleable iron; insert and spud may be either steel or malleable iron; NPT male and female with ground joint or washer seal	Machined from cold drawn bar steel, heat-treated for toughness	Plated malleable iron, stainless steel or bronze	Tubular steel, stainless, malleable iron, aluminum or brass with serrated shank; NPT male threads, grooved or beveled for welding
Attachment	Clamps, bands or crimp/swage ferrules	Interlocking clamps	Interlocking clamps	Interlocking clamps or bands	Clamps or bands



Industrial Hose Coupling	Long Shank Inserts	Stainless Steel Hose Barbs	Brass Hose Barb Fittings	Brass Garden Hose Fittings	Water Suction	Stainless Steel Short Shank Inserts	Brass Air Hose Fittings
Service	Medium pressure air, water, sanitary and liquids in suction or discharge service	Low or medium pressure air, water and fluids			Heavy-duty water discharge and suction service	Low pressure air and water service	Low pressure air
Size Range	3/8" to 4"	3/16" to 1"			1" to 8"	3/16" to 1"	1/4" to 1/2"
Description	Machined steel or brass with serrated shank; NPT or NPSM male and female; thread seal to NPT and washer seal to NPSM female	Machined brass with serrated shank; NPT or NPTF male and rigid female, and NPSM swivel female; thread seal to NPT or NPTF female, and ball end or washer seal to NPSM female			Malleable iron, aluminum and/or brass	Cast brass with serrated shank; GHT, NPSM or NPT male and NPSH female; washer seal	Brass with NPT threads
Attachment	Clamps or bands	Clamps or bands			Clamps or bands	Clamps or bands	Screw onto hose

Industrial Hose Clamps and Ferrules



Industrial Hose Clamps and Ferrules	Interlocking Clamps	Double Bolt Clamp	Form Seal Clamp	Brass Hose Ferrules
Service	Heavy-duty high pressure applications such as air, steam, water, spray, LPG service	Low or medium pressure, and suction service with large sizes of combination nipples or couplings	Low or medium pressure, and suction service	Low or medium pressure air or water using general-purpose hose and brass inserts
Size Range	9/16" to 7-3/16" hose O.D.	3-1/2" to 17-1/2" hose O.D.	3/4" to 6" hose O.D.	31/64" to 1-1/2" hose O.D.
Description	Malleable iron, plated	Cast malleable iron, plated and brass	Pre-formed flat stainless steel, high carbon steel	Made from various gauge brass tubing; stamped with Standard Industrial Part Number
Attachment	Clamps bolted into position	Applied over hose and bolted into position	Special locking band tool	Crimped on using either ribbed or plain die

Reminder

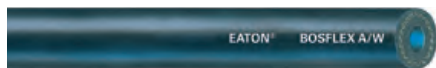
The following pages contain brief descriptions of the Industrial Hoses that Lawson offers. With each hose description there is a chart that lists the Couplings and Clamps/Ferrules that can be used to terminate the hose to make a custom assembly.

The final working pressure of a hose assembly is the **lesser** of the following: **hose working pressure** or **the pressure listed on the chart**. The final hose assembly should be marked accordingly. Also, next to the pressure in the charts there is a number in parenthesis (#) this number corresponds to the number of clamps necessary to make a hose connection.

The necessary steps required to make the hose assembly are listed in the charts under the Assembly Procedures Column.

Multipurpose Air and Water Hose

H0105/H0106 Bosflex Air and Water Hose (Good Quality)



Features

- Inner Tube Material: EPDM (RMA Class C)
- Outer Cover: EPDM, pinpricked
- Reinforcement: Fiber, 2- or 4-spiral, or 2 braid
- Color: Red or black
- Temperature Range: -40°F to +180°F (-40°C to +82°C)

Features/Advantages

- Multipurpose hose
- Heat resistant
- Economical
- Abrasion, age and water resistant
- Longer lengths
- Poor resistance to petroleum fluids
- Easy identification

Applications

- Spraying and conveying water-based liquid fertilizers and pesticides
- Convey air and water

Markets

- Agriculture
- Construction
- Forest industry
- Assembly/manufacturers
- Ship building

H1812 Industrial Air and Water Hose (Better Quality)



Features

- Inner Tube Material: EPDM (RMA Class C)
- Outer Cover: EPDM
- Reinforcement: Fiber, 2 braid
- Color: Red
- Temperature Range: -40°F to +180°F (-40°C to +82°C)

Features/Advantages:

- Excellent ozone resistance
- Good chemical resistance
- Braided reinforcement
- Good temperature resistance
- Poor resistance to petroleum fluids
- Excellent coupling retention for impulse
- Easy identification

Applications

- Pneumatic tools on production line
- Provide power to air operated equipment
- Convey air and water

Markets:

- Agriculture
- Construction
- Ship building
- Metal working
- Paper/pulp industry

H1776/H1777 Perfection 300 Air and Water Hose (Best Quality)



Features

- Inner Tube Material: Nitrile (RMA Class A)
- Outer Cover: Vinyl nitrile
- Reinforcement: Fiber, 1 or 2 braid
- Color: Red
- Temperature Range: -40°F to +180°F (-40°C to +82°C)

Features/Advantages

- Multipurpose hose
- High working pressure
- Braided reinforcement
- Abrasion, age and water resistant
- Rugged, long life
- Continuous permanent branded layline
- Easy identification

Applications

- Pneumatic tools on production line
- Provide power to air operated equipment
- Convey air and water

Markets

- Assembly/manufacturers
- Construction
- Forest industry
- Metal working
- Ship building

Coupling and Clamp Selection

Application	Couplings	Clamps and Ferrules	Assembly Procedure	Hose Size and Fitting Maximum Recommended Working Pressure (PSI)*							
				1/4"	3/8"	1/2"	5/8"	3/4"	1"	1-1/4"	1-1/2"
Air	Quick Acting**	Form-Seal Clamps	2102	—	—	150 (1)	150 (2)	150 (2)	150 (2)	—	—
	SS Hose Barbs, Brass Hose Barb Fittings, Brass Garden Hose Fittings	Brass Air Hose Ferrules	2304	200	150	150	100	100	100	—	—
		Form-Seal Clamps	2100 – 2101	—	—	150 (1)	100 (1)	100 (1)	100 (1)	—	—
	Brass Air Hose Fittings	N/A	2305	250	250	250	—	—	—	—	—
	Combination Nipple	Form-Seal Clamps	2100 – 2101	—	—	250 (1)	200 (1)	200 (1)	150 (1)	—	—
	Long Shank			—	—	300 (2)	300 (2)	300 (2)	300 (2)	—	—
	Quick Acting**	Interlocking Clamps	2000	—	150	150	—	150	150	—	—
Water	Interlocking, Steel Nipple		2000 – 2004	600	600	600	—	600	600	600	600
	SS Hose Barbs, Brass Hose Barb Fittings, Brass Garden Hose Fittings	Form-Seal Clamps	2100 – 2101	—	—	150 (1)	100 (1)	100 (1)	100 (1)	—	—
		Brass Air Hose Ferrules	2304	200	150	150	100	100	—	—	—
	Water Suction, SS Short Shank Inserts	Form-Seal Clamps	2100 – 2101	—	—	150 (1)	100 (1)	100 (1)	100 (1)	75 (1)	75 (2)
	Combination Nipple			—	—	250 (1)	200 (1)	200 (1)	150 (1)	150 (1)	125 (2)
	Long Shank			—	—	300 (2)	300 (2)	300 (2)	300 (2)	300 (3)	150 (3)
	Cam and Groove			—	—	150 (2)	—	250 (2)	250 (2)	250 (2)	250 (2)
	Interlocking, Steel Nipple	Interlocking Clamps	2000 – 2002	600	600	600	—	600	600	600	600
	Water Suction, SS Short Shank Inserts	Double Bolt Clamps	2201	—	—	—	—	—	—	—	75 (1)
	Combination Nipple			—	—	—	—	—	—	—	125 (1)
	Long Shank			—	—	—	—	—	—	—	150 (3)

*The number in parenthesis is the number of bands/clamps required.

**Must use mating Quick Acting fittings with safety clip installed.



Multipurpose Air and Water Hose

Horizon® 200 (Good Quality) Horizon® 300 (Better Quality)



Features

- Inner Tube Material: Versigard® synthetic rubber (RMA Class C)
- Outer Cover: Versigard® synthetic rubber
- Reinforcement: Spiral synthetic yarn, 2" is braided
- Color: Black, red, yellow, green or blue
- Temperature Range: -40°F to +190°F (-40°C to +88°C)

Features/Advantages

- Multipurpose hose
- Heat resistant
- Good chemical resistance
- Abrasion, age and water resistant
- Poor resistance to petroleum fluids
- Economical

Applications

- Convey air and water

Markets

- Agriculture
- Construction
- Forest industry
- Assembly/manufacturers
- Ship building

F5™ (Better Quality)



Features

- Inner Tube Material: Flexible Thermoplastic (RMA Class B)
- Outer Cover: Flexible Thermoplastic (RMA Class B)
- Reinforcement: Braided polyester yarn
- Color: Blue
- Temperature Range: -40°F to +158°F (-40°C to +70°C)

Features/Advantages:

- Non-marking surface
- Good chemical resistance
- Abrasion, ozone and weather resistant
- Good temperature resistance
- Excellent resistance to petroleum fluids
- Up to 45% lighter than comparable PVC and rubber air hoses

Applications

- Pneumatic tools on production line
- Provide power to air operated equipment
- Convey air and water

Markets:

- Manufacturing
- Construction
- Ship building
- Metal working
- Paper/pulp industry

Gorilla® (Best Quality)



Features

- Inner Tube Material: Nitrile (RMA Class A)
- Outer Cover: Yellow Carbryn® synthetic rubber, (RMA Class A) MSHA approved
- Reinforcement: Spiral Flexten® yarn, 2" is braided
- Color: Yellow
- Temperature Range: -20°F to +190°F (-29°C to +88°C)

Features/Advantages

- Multipurpose hose
- High working pressure
- Braided reinforcement
- Abrasion, age and water resistant
- Nonconductive, minimum electrical resistance greater than one mega-ohm/in. of hose length at 1,000V DC

Applications

- Pneumatic tools on production line
- Provide power to air operated equipment
- Convey air and water

Markets

- Railroads
- Construction
- Quarries/mines
- Oil and gas industries
- Ship building

Coupling and Clamp Selection

Application	Couplings	Clamps and Ferrules	Assembly Procedure	Hose Size and Fitting Maximum Recommended Working Pressure (PSI)*								
				1/4"	3/8"	1/2"	5/8"	3/4"	1"	1-1/4"	1-1/2"	
Air	Quick Acting**	Form-Seal Clamps	2102	—	—	150 (1)	150 (2)	150 (2)	150 (2)	—	—	—
	SS Hose Barbs, Brass Hose Barb Fittings, Brass Garden Hose Fittings	Brass Air Hose Ferrules	2304	200	150	150	100	100	100	—	—	—
		Form-Seal Clamps	2100 – 2101	—	—	150 (1)	100 (1)	100 (1)	100 (1)	—	—	—
	Brass Air Hose Fittings	N/A	2305	250	250	250	—	—	—	—	—	—
	Combination Nipple	Form-Seal Clamps	2100 – 2101	—	—	250 (1)	200 (1)	200 (1)	150 (1)	—	—	—
	Long Shank			—	—	300 (2)	300 (2)	300 (2)	300 (2)	—	—	—
	Quick Acting**	Interlocking Clamps	2000	—	150	150	—	150	150	—	—	—
	Interlocking, Steel Nipple		2000 – 2004	600	600	600	—	600	600	600	600	600
Water	SS Hose Barbs, Brass Hose Barb Fittings, Brass Garden Hose Fittings	Form-Seal Clamps	2100 – 2101	—	—	150 (1)	100 (1)	100 (1)	100 (1)	—	—	—
		Brass Air Hose Ferrules	2304	200	150	150	100	100	—	—	—	—
	Water Suction, SS Short Shank Inserts	Form-Seal Clamps	2100 – 2101	—	—	150 (1)	100 (1)	100 (1)	100 (1)	75 (1)	75 (2)	75 (2)
	Combination Nipple			—	—	250 (1)	200 (1)	200 (1)	150 (1)	150 (1)	125 (2)	75 (2)
	Long Shank			—	—	300 (2)	300 (2)	300 (2)	300 (2)	300 (3)	150 (3)	125 (4)
	Cam and Groove			—	—	150 (2)	—	250 (2)	250 (2)	250 (2)	250 (2)	250 (2)
	Interlocking, Steel Nipple	Interlocking Clamps	2000 – 2002	600	600	600	—	600	600	600	600	600
	Water Suction, SS Short Shank Inserts	Double Bolt Clamps	2201	—	—	—	—	—	—	—	75 (1)	75 (1)
	Combination Nipple			—	—	—	—	—	—	—	125 (1)	75 (1)
	Long Shank			—	—	—	—	—	—	—	150 (3)	125 (3)

*The number in parenthesis is the number of bands/clamps required.

**Must use mating Quick Acting fittings with safety clip installed.

High Pressure Air Hose

H9622 Contractors Air Hose (Good Quality)



Features

- Inner Tube Material: Nitrile (RMA Class A)
- Outer Cover: Neoprene, pinpricked cover
- Reinforcement: Wire, 1 or 2 braid
- Color: Yellow
- Temperature Range: -40°F to +212°F (-40°C to +100°C)

Features/Advantages

- Multipurpose hose
- Heat resistant
- Economical
- Abrasion, age and water resistant
- Good resistance to petroleum fluids
- Easy identification
- Continuous permanent branded layline

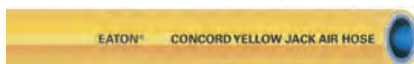
Applications

- Provide power to air operated construction equipment (bull lines, jackhammer, etc.)
- Power air-operated drills, boring equipment

Markets

- Oil field industry
- Construction
- Drilling equipment
- Mining

H6008 Concord Yellow Jack Air Hose (Better Quality)



Features

- Inner Tube Material: Nitrile (RMA Class A)
- Outer Cover: Neoprene, pinpricked cover MSHA approved
- Reinforcement: Wire, 1, 2 or 3 braid
- Color: Yellow, green
- Temperature Range: -40°F to +212°F (-40°C to +100°C)

Features/Advantages

- Excellent ozone resistance
- Good chemical resistance
- Braided reinforcement
- Good temperature resistance
- Abrasion, oil and weather resistant
- Easy identification
- Continuous permanent branded layline

Applications

- Provide power to air operated construction equipment (bull lines, jackhammer, etc.)
- Power air-operated drills, boring equipment

Markets

- Oil field industry
- Construction
- Drilling equipment
- Mining

H6009 Boston Bulldog Gold Air Hose (Best Quality)



Features

- Inner Tube Material: Nitrile (RMA Class A)
- Outer Cover: Carboxylated nitrile/pinpricked cover
- Reinforcement: Wire, 1, 2 or 3 braid
- Color: Black
- Temperature Range: -40°F to +25°F (-40°C to +121°C)

Features/Advantages

- Multipurpose hose
- High temperature resistance
- Braided reinforcement
- Excellent abrasion, age and weather resistance
- Continuous permanent branded layline
- Easy identification

Applications

- Power air-operated drills, boring equipment
- Use when a reinforced hose is needed for abusive applications

Markets

- Oil field industry
- Construction
- Drilling equipment
- Mining
- All markets

Coupling and Clamp Selection

Application	Couplings	Clamps and Ferrules	Assembly Procedure	Hose Size and Fitting Maximum Recommended Working Pressure (PSI)*								
				1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
Air	Quick Acting*	Interlocking Clamps	2000	150	150	150	—	—	—	—	—	—
	Interlocking, Steel Nipple		2000 – 2004	600	600	600	600	600	600	450	450	450

*Must use mating Quick Acting fittings with safety clip installed.



Air and Water Hose

Insta-Grip™ 250 Push-On (Best Quality)



Features

- Inner Tube Material: Chemivic™ synthetic rubber (RMA Class A)
- Outer Cover: Chemivic™ synthetic rubber (RMA Class B)
- Reinforcement: Spiral Flexten® yarn
- Color: Red, black or green
- Temperature Range: -20°F to +290°F (-29°C to +88°C)

Features/Advantages

- Multipurpose hose
- High temperature resistance
- Oil resistant
- Use with push-on fittings
- Easy identification

Applications

- Power air-operated drills, boring equipment
- Use when a reinforced hose is needed for abusive applications

Markets

- Oil field industry
- Construction
- Drilling equipment
- Mining
- All markets

Coupling and Clamp Selection

Application	Couplings	Assembly Procedure	Hose Size and Fitting Maximum Recommended Working Pressure (PSI)				
			1/4"	3/8"	1/2"	5/8"	3/4"
Air	Barb-Lok	2000	175	175	175	175	175

Cleaning Equipment Hose

Neptune™ 1500 (Good Quality)



Features

- Inner Tube Material: Nitrile synthetic rubber
- Outer Cover: Synthetic rubber (RMA Class B)
- Reinforcement: Braided (1) synthetic yarn up through 1/2" Braided (2) synthetic yarn for 3/4"
- Color: Black, red, yellow, green or blue
- Temperature Range: -20°F to +200°F (-29°C to +93°C)

Features/Advantages

- Multipurpose hose
- Good chemical resistance
- Abrasion, age and water resistant
- Poor resistance to petroleum fluids
- 1,200 – 1,500 PSI working pressure
- Not recommended for steam service

Applications

- Convey air, water and some chemicals

Markets

- Agriculture
- Construction
- Forest industry
- Assembly/manufacturers
- Ship building

Neptune™ 3000 (Better Quality)



Features

- Inner Tube Material: Nitrile synthetic rubber
- Outer Cover: Synthetic rubber (RMA Class B)
- Reinforcement: 1 steel wire braid reinforcement
- Color: Black, red, yellow, green or blue
- Temperature Range: -20°F to +250°F (-29°C to +121°C)

Features/Advantages:

- Multipurpose hose
- Good chemical resistance
- Good oil resistance
- Abrasion, age and weather resistant
- Poor resistance to petroleum fluids
- 3,000 PSI working pressure
- Not recommended for steam service

Applications

- Convey air, water and some chemicals

Markets:

- Manufacturing
- Construction
- Ship building
- Metal working
- Paper/pulp industry

Coupling and Clamp Selection

Application	Couplings	Clamps and Ferrules	Assembly Procedure	Hose Size and Fitting Maximum Recommended Working Pressure (PSI)*				
				1/4"	3/8"	1/2"	5/8"	3/4"
Air	Quick Acting**	Form-Seal Clamps	2102	–	–	150 (1)	150 (2)	150 (2)
	SS Hose Barbs, Brass Hose Barb Fittings, Brass Garden Hose Fittings	Brass Air Hose Ferrules	2304	200	150	150	100	100
		Form-Seal Clamps	2100 – 2101	–	–	150 (1)	100 (1)	100 (1)
	Brass Air Hose Fittings	N/A	2305	250	250	250	–	–
	Combination Nipple	Form-Seal Clamps	2100 – 2101	–	–	250 (1)	200 (1)	200 (1)
	Long Shank			–	–	300 (2)	300 (2)	300 (2)
	Quick Acting**	Interlocking Clamps	2000	–	150	150	–	150
Water	Interlocking, Steel Nipple		2000 – 2004	600	600	600	–	600
	SS Hose Barbs, Brass Hose Barb Fittings, Brass Garden Hose Fittings	Form-Seal Clamps	2100 – 2101	–	–	150 (1)	100 (1)	100 (1)
		Brass Air Hose Ferrules	2304	200	150	150	100	100
	Water Suction, SS Short Shank Inserts	Form-Seal Clamps	2100 – 2101	–	–	150 (1)	100 (1)	100 (1)
	Combination Nipple			–	–	250 (1)	200 (1)	200 (1)
	Long Shank			–	–	300 (2)	300 (2)	300 (2)
	Cam and Groove			–	–	150 (2)	–	250 (2)
Chemical (rubber-lined)	Interlocking, Steel Nipple	Interlocking Clamps	2000 – 2002	600	600	600	–	600
	Combination Nipple	Form-Seal Clamps	2100 – 2101	–	–	125 (1)	–	125 (1)
	Long Shank			–	–	150 (2)	–	150 (2)
	Cam and Groove			–	–	150 (2)	–	250 (2)
	Interlocking Inserts, Steel Nipples	Interlocking Clamps	2000 – 2004	–	–	600	–	600

*The number in parenthesis is the number of bands/clamps required.

**Must use mating Quick Acting fittings with safety clip installed.



Cleaning Equipment Hose (cont.)

Whitewater® (Best Quality)



Features

- Inner Tube Material: Pyrosyn® synthetic rubber tube
- Outer Cover: Hysunite™ synthetic rubber (RMA Class B)
- Reinforcement: 1 steel wire braid reinforcement
- Color: Black or red
- Temperature Range: Hot water at 325°F (163°C) at 300 PSI for steam
250°F (121°C) at 3,000 PSI (2,500 PSI on 1/2")
for pressure washer applications

Features/Advantages

- Light weight
- High working pressure
- Good chemical resistance
- Abrasion, oil and weather resistant
- Good oil resistance

Applications

- For use on either steam cleaner machines or combination steam cleaner/pressure washer machine

Markets

- Railroads
- Construction
- Quarries/mines
- Oil and gas industries
- Ship building

Coupling and Clamp Selection

Application	Couplings	Clamps and Ferrules	Assembly Procedure	Hose Size and Fitting Maximum Recommended Working Pressure (PSI)*		
				1/4"	3/8"	1/2"
Air	Quick Acting**	Interlocking Clamps	2000	–	150	150
	Interlocking, Steel Nipple		2000 – 2004	600	600	600
Water	SS Hose Barbs, Brass Hose Barb Fittings, Brass Garden Hose Fittings	Form-Seal Clamps	2100 – 2101	–	–	150 (1)
		Brass Air Hose Ferrules	2304	200	150	150
	Water Suction, SS Short Shank Inserts	Form-Seal Clamps	2100 – 2101	–	–	150 (1)
	Combination Nipple			–	–	250 (1)
	Long Shank			–	–	300 (2)
	Cam and Groove			–	–	150 (2)
	Interlocking, Steel Nipple	Interlocking Clamps	2000 – 2002	600	600	600
Chemical (rubber-lined)	Combination Nipple	Form-Seal Clamps	2100 – 2101	–	–	125 (1)
	Long Shank			–	–	150 (2)
	Cam and Groove			–	–	150 (2)
	Interlocking Inserts, Steel Nipples	Interlocking Clamps	2000 – 2004	–	–	600

*The number in parenthesis is the number of bands/clamps required.

**Must use mating Quick Acting fittings with safety clip installed.