JINDAL

AIRCONNECT

PRODUCT CATALOGUE

Multi-Layer Composite Pipe and Fittings (PE-AL-PE)
www.jindaltubes.com

JINDALTUBES
A Unit of D.S. Jindal Group

JINDALTUBES

INSPIRING INNOVATION

Jindal Tubes, a pioneering force in the pipe manufacturing industry. As a vital part of the renowned DS Jindal Group, our foundation was laid by visionary entrepreneur Arvind Jindal, with a mission to transform India's plumbing landscape through innovation and technology. Inspired by our tagline, "Inspiring innovation," we embarked on a journey to revolutionize the Indian piping systems by introducing German-engineered Multi-Layer Composite Pipes (PE-AL-PE Pipes) to the market, a concept previously unexplored in our country.

Our inception marked the beginning of a new era in plumbing solutions, blending quality, efficiency, and technological advancement. The introduction of these high-caliber pipes not only set us apart but also paved the way for a growing market that continues to welcome new entrants each year. At Jindal Tubes, our commitment goes beyond just manufacturing. We aim to lead the charge in innovation, ensuring that we continually bring high-quality products that redefine the plumbing systems in India.

Air Connect, the NEXT-Generation piping system for industrial systems, is manufactured with the latest german technology at our state of the art facility in Dehradun, Uttarakhand, India.

Air Connect is an innovative piping system for compressed air and inert gas distribution that uniquely combines all the benefits of plastic and metal in one pipe. Pipes and fittings are joined together using compression technique which has various benefits such as Fast and easy installation, no need to weld, glue, fuse or thread. Air Connect not only extends the life of the system, but significantly reduces leakage that leads to saving of time, labour and operating costs.

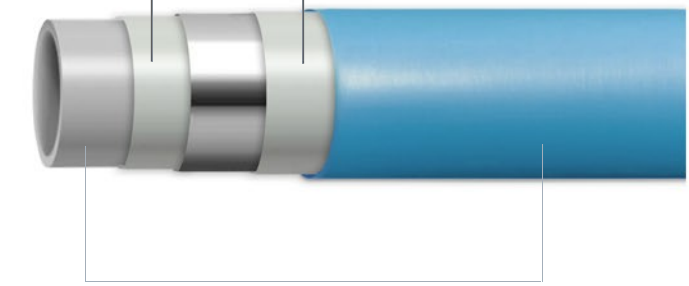
AIR-CONNECT **ALUMINIUM** COMPOSITE PIPE

Air Connect Pipes are constructed of an inner and outer layer of Polyethylene sandwiched over an aluminum core. All the layers are permanently bonded together by an intermediate layer of polyethylene based adhesive. The aluminum core is sealed by Over-lap welding technology which enables the pipes to withstand high working pressures.

SIZE RANGE	COIL LENGTH
16mm	200 mtr
20mm	200 mtr
25mm	100 mtr
32mm	100 mtr
40mm	100 mtr
50mm	50 mtr

Adhesive Layers
The adhesive layer perfectly bonds the polyehtylene and aluminium layers and absorbs the eventual shifting movements between the layers.

Aluminium Core
The aluminium core stays where it lays and has high mechanical strength. It has the ability to withstand high temperatures and pressure.The aluminium core acts as the pipe's backbone with its mechanical resistance to deformation.



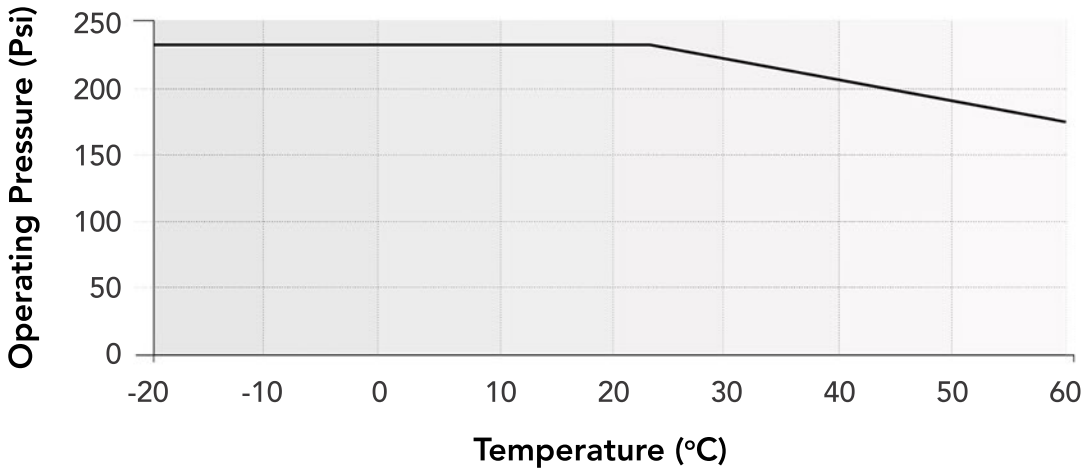
Internal & External Polyethylene Layers
The Polyethylene layers are lightweight, flexible and chemically inert. It Provides a smooth surface for better flow and is a food grade material.

- 50 Years of working life
- Hygienic, Toxic free, Rust free and no growth of micro-organisms
- 30% more flow of fluid than in metal pipes
- Easily bendable never springs back
- Easy installation and wide range of usage
- Light in weight, easy to carry and store
- Low expansion and contraction
- Quite flow
- Fire retardant

TECHNICAL SPECIFICATIONS

Maximum Working Pressure	232 Psi at 23°C 175 Psi at 60°C

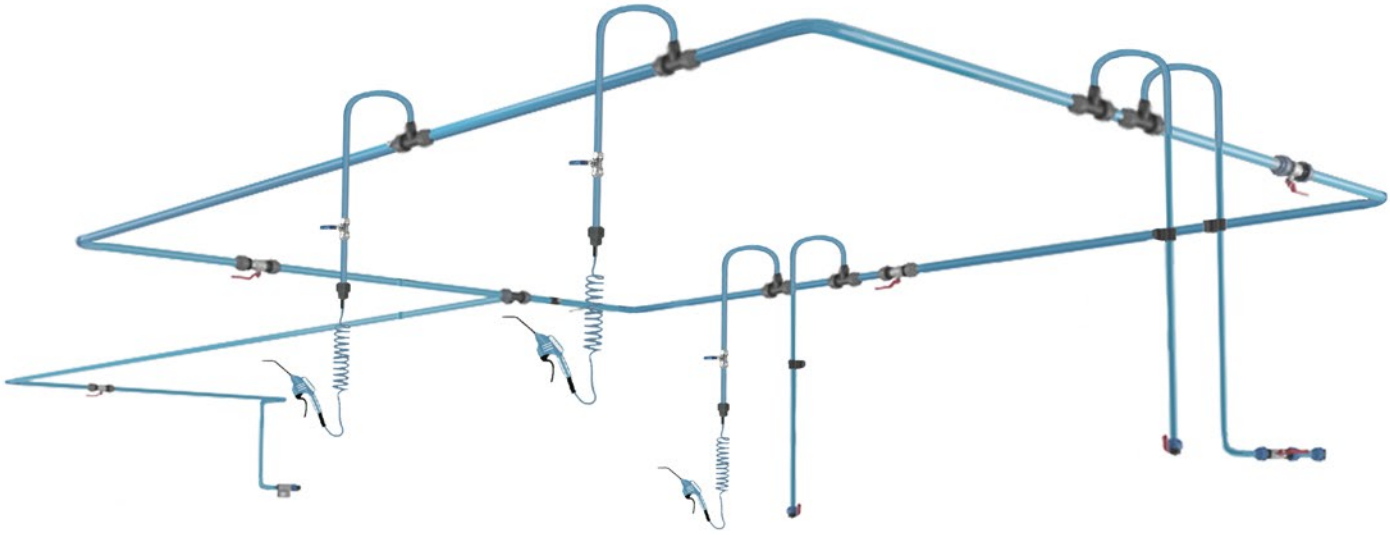
Pressure - Temperature Rating (12-16mm to 40-50mm)



Working Temperature Range	-20°C to 60°C
Thermal Conductivity	0.45 W/m.k
Co-efficient of Thermal Linear Expansion	25 x 10^{-6} m/m.k
Minium Burst Pressure	870 psi - 507.5 psi
Long Term Hydrostatic Strength	391.5 psi - 290 psi

Raw Material - POLYETHYLENE

Polyethylene or PE is a polymer consisting of long chains of the monomer ethylene. It is created through the polymerization of ethene and is classified into different types based on Density. High Density Polyethylene or HDPE is used to manufacture Air Connect Pipes. It has a low degree of branching and thus stronger inter- molecular forces and tensile strength. The HDPE used in Air Connect Pipes is food grade and hence hygenic.



PIPING SYSTEM DESIGN

1. Locate each process, work station, or piece of equipment that uses compressed air. They should be located on a plan, and a complete list should be made to simplify record keeping. This initial process will act as a beginning for your piping layout.

2. Determine the volume of air and pressure range required at each location. Information regarding pressure and flow rates of the equipment such as tools can be obtained from the manufacturer. If the pressure and flow rates are not known, assign some preliminary rates until the specific values can be obtained.

3.Determine the system conditioning requirements for each piece of equipment. This includes the allowable moisture content, particulate size, and oil content. The system may require conditioning equipment including dryers, filters, lubricators and pressure regulators.

4. Establish how much time the individual tool or process will be in actual use for a one-minute period of time. This is referred to as the 'duty cycle'. In most industrial applications, tools or operations of a similar nature are usually grouped together.

5. Establish the maximum number of locations that may be used simultaneously on each main, and for the project as a whole. This is known as the 'use factor'.

6. Establish the extent of allowable leakage. Leakage is a result of the number and type of connections, the use of disconnects, the age of the system and the quality of the initial assembly process. Many small tools and operations will result in more leakage then fewer larger applications. A well maintained compressed air system will have an allowable leakage rate of 2-5%.

Note: This allowable leakage rate applies only to compressed air made on site. All other inert gas systems must be designed with the strictest health and safety considerations in mind including preventing leakage of any pipe contents.

7. Establish any allowance for future expansion.Thought should be given to over sizing some components (i.e., main supply lines) to avoid the cost of replacement
at a later date.

8. Select the air compressor layout and assign a preliminary pressure drop for the system.

9. Select the air compressor type, conditioning equipment, equipment location, and air inlet, making sure that scfm (L/min) is used consistently for both the system and compressor capacity rating.

TO START, THE FOLLOWING INFORMATION MUST BE AVAILABLE:

- Total connected flow rate cfm (L/min) of all air-using devices, including flow to the air dryer system, if Applicable.

- Maximum pressure(psi) of all air using devices.

- Duty cycle and use factors for these devices giving maximum expected use of air.

- Leakage and future expansion allowance, cfm(L/min).

- Allowable pressure drops for the entire system, including piping and conditioning equipment.

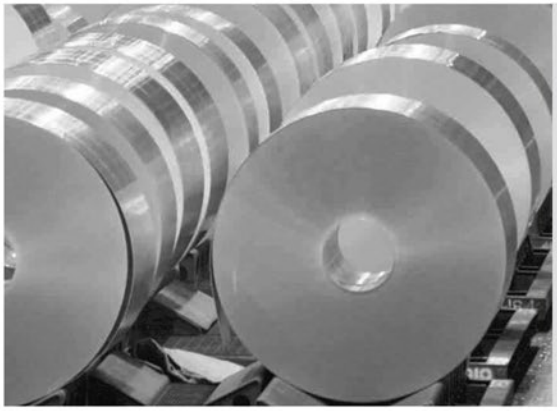
- Altitude, temperature, and contaminant removal corrections.

- Location where adequate space is available for air compressor and all ancillary equipment.

- Produce a final piping layout and size the piping Network.

FEATURE **COMPARISON**

FEATURE	AIR-Connect	Aluminium Pipes	PPR-C Pipes
COST	Most cost-effective. Low initial investment, long Working life and no maintenance.	Most expensive	Least Expensive but has a short Working Life
HYGIENE	Hygienic, made from 100% Food Grade Polyethylene.	Hygienic	Not hygienic, is not made from Food grade material.
FLOW RATE	Best, has smooth inner surface and minimum use of fittings.	Good, has smooth inner surface but use of more fittings (elbows and couplers)	Good, has smooth inner surface but use of more fittings (elbows and couplers)
CORROSION RESISTANCE	Good	Good	Good
BENDABILITY	Bendable without any spring back	Not bendable	Not bendable
REQUIREMENT OF FITTINGS	Minimum, use of Elbows and Couplers is eliminated	High, fittings are required at bends and joints at every 6 mts	High, fittings are required at bends and joints at every 6 mts
JOINING METHOD	Compression method, Leak proof, fittings can be re-opened for maintenance work	Push-in method	Electric fusion method, results in a permanent joint and cannot be re-opened for maintenance work.
WEIGHT	Light-weight, Upto 90% lighter than GI pipes.	Heavy, 5 times heavier than Air Connect Pipes	Heavy, compared to Air Connect Pipes
STORAGE, HANDLING & TRANSPORTAIION	Easy, are light weight and packed in coils of upto 200 mts. Come in Carton packing.	Difficult, are heavy and packed in lengths of 6 mts	Difficult, are heavy and packed in lengths of 6 mts
INSTALLATION	Fast and Easy. Requires basic Tools only.	Fast and Easy. Requires basic Tools only.	Time consuming, requires electricity and Heating machine
LINEAR THERMAL EXPANSION	Low	Low	Low
WASTAGES	Zero wastage	High	High

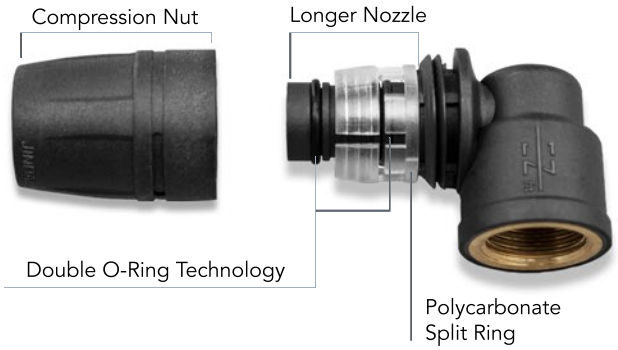


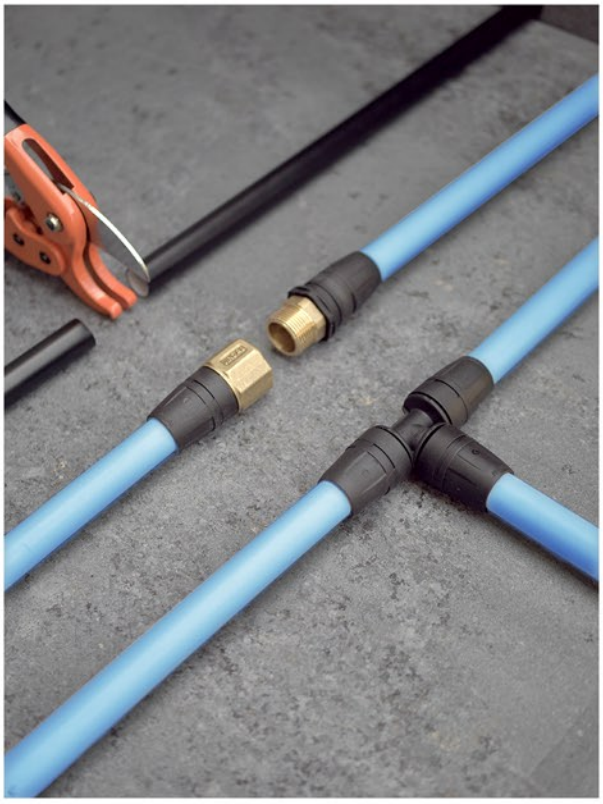
Raw Material - ALUMINIUM

Aluminum is a soft, lightweight, non-toxic and malleable metal with appearance ranging from silvery to dull gray depending on surface roughness. Aluminum alloys have yield strengths ranging from 200 mpa to 600 mpa.
For Air Connect pipes, a specialized grade of Aluminum is used which is manufactured specifically for these pipes and have the right balance of strength and flexibility as required for compressed air application.

JINDAL **EZ-FIT** COMPRESSION FITTINGS

E-Z Fittings combine the positive feature of high reliability with a simple installation technique that does not require any special tools. The permanent pipe joint is achieved by compression i.e. tightening the nut against the tapered split ring. The profiles of the two pieces are designed to cause a progressive shrinkage of the split ring and to distribute the compression forces across the contact surface. A seal housing has been designed with a special slip-proof profile called O-Rings that come into direct contact with the pipe





EZ Fittings are made from high quality engineering Nylon using advance injection moulding that makes it extremely reliable and reluctant to leakages. The fittings are rigid and lightweight at the same time.

The simplicity and economic aspect of this system is based on the use of spanners, standardised threads, which make it possible to connect with any system.

EZ Fittings come in 3 Categories as listed below:

EZ-FIT

- Full Plastic component
- Developed with advanced injection moulding
- Lightweight & Economical
- Removable and Reusable
- Quick and simple installation

EZ-HYBRID

- Brass Male thread with Plastic Nozzle
- Hybrid Technolgy
- Strength of Brass combined with the cost effectiveness of plastic
- Removable and Reusable
- Quick and simple installation

EZ-BRASS

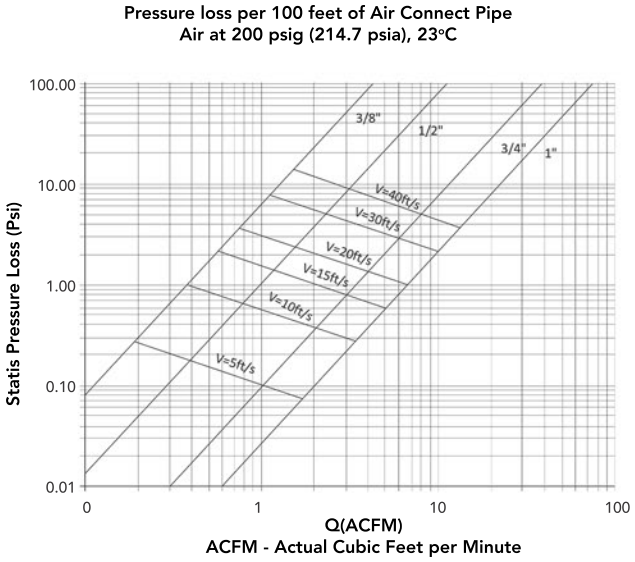
- Full Brass Body
- Plastic Compression Nut and Split ring
- Superior Strength
- Removable and Reusable
- Quick and simple installation

DETERMINING **PRESSURE LOSS** IN JINDAL MLC PIPE

1) In order to use pressure drop charts, it is necessary to find the equivalent length of run from the compressor to the farthest point in the step. In addition to the actual measured pipe length, the effect of fittings must be considered. This is because fittings create an obstruction to the flow of air. This degree of obstruction has been converted to an equivalent length of pipe in order to make calculations easy.

2) Determine the actual pressure drop that will occur only in the piping system. Since the air compressor has not been selected yet, this figure is variable. A smaller pipe size may lead to higher compressor horsepower. It is considered good practice to oversize distribution mains to allow for future growth and the addition of condition equipment that may add a pressure drop not anticipated at the time of original design. It should be noted that this practice may result in a higher initial cost for the piping system.

3) Size the piping using the appropriate charts, having first calculated the flow rate at the operating pressure and operating temperature, scfm, and the allowable friction loss in each section of the piping being sized. Since all pipe sizing charts are calculated using loss of pressure per some length of piping (100 ft {30.5m}), it is necessary to arrive at the required value for the chart you are using.



Raw Material - NYLON (Glass filled)

Nylon is one of the most widely used plastics because of its extreme strength, wear resistance, and self lubricating properties. Nylons are also known to have high impact resistance, high operating temperature and are light weight. Nylon is commonly used as a replacement for bronze, brass, aluminum, steel and other metals. The glass reinforcement gives the material higher compressive strength and rigidity, as well as improved frictional characteristics.

CONTAMINANTS

There are four general classes of contamination:

Liquids | Vapor | Gas | Particulates

An understanding of the various pollutants in the air is helpful when an engineer has to decide what equipment is required to effectively reduce or remove them. The required level of protection from the various contaminants depends upon the purpose for the air. Prior to the selection of equipment the performance criteria for each system, along with the identity and quantity of pollutants, must be determined.

DETERMINING PRESSURE LOSS USING EQUATION

As air flows through the Air Connect piping system, it will experience friction resistance between the air and the pipe wall resulting in a pressure loss.

The pressure drops in the Air Connect pipe can be determined using the following equation

$$\Delta p = \frac{\rho \cdot \mu \cdot l \cdot v^2}{2d}$$

d = Internal Diameter of Pipe (in Mtr)
l = Pipe Length (in Mtr)
v = Air Velocity (Mtr/Sec)
p = Pressure Loss (Pa)
μ = Coefficient of friction

PRESSURE LOSS THROUGH FITTINGS IN EQUIVALENT FEET

SPECIFICATION (mm)	FITTING TYPE	VELOCITY (fps) 200psi @ 23°C					
		5	10	15	20	30	40
1216	Straight	1	2	2	2	3	3
	Tee Branch, Elbow	4	5	5	6	6	6
1620	Straight	2	3	4	4	4	4
	Tee Branch, Elbow	6	7	8	8	9	9
2025	Straight	4	4	5	5	5	6
	Tee Branch, Elbow	7	8	9	10	10	10

LEAKAGE SIZE (mm)	ENERGY LOSS (kw)	COST OF AIR LEAKAGE (Rs/annum)
0.8	0.2	9,000
1.6	0.8	36,000
3.2	3.0	1,35,000
6.4	12	5,40,000

ADDITIONAL COST INCURRED DUE TO COMPRESSED AIR LEAKAGE

View Complete Product range here

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