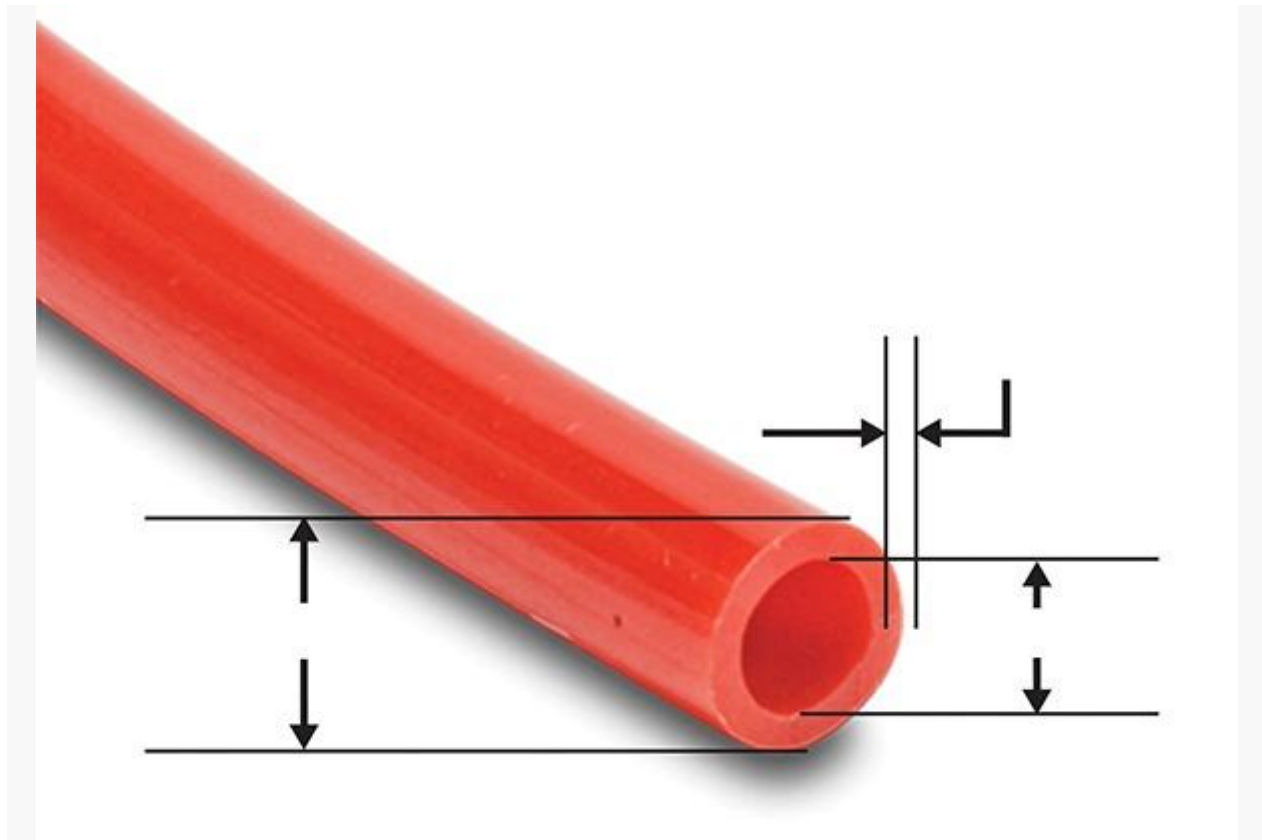


Select the Right Pneumatic Tubing and Hose



Remember these important dimensions when specifying pneumatic tubing and hose.

Quick Reminders

1. Tubing is specified by the outside diameter (OD).
Hose is specified by the inside diameter (ID). Don't get these specifications confused.
2. To achieve the best-possible leak-free connection, be sure to cut tubing with a tube cutter.

When it comes to today's pneumatic applications, industry has a variety of options for connecting air-preparation systems, valves, and cylinders. Most users turn to flexible pneumatic tubing or hose rather than rigid tubing—and many different types of both are available .

Flexible tubing is the most common way to connect pneumatic valves to cylinders, actuators, and vacuum generators in modern automated equipment, with hose coming in a close second. Despite tubing type, be careful to not confuse outside diameter (OD) with inside diameter (ID), and be aware that flexible and rigid tubing reflect very different materials of construction. Remember, too, that tubing is specified by outside diameter and hose is specified by inside diameter.

Most tubing used in pneumatic systems is less than 1-in. OD with common pneumatic main supply circuits in the 1/4-in. to 1/2-in. tube OD range, and pneumatic control circuits in the 1/8-in. to 3/8-in. tube OD range. Pneumatic tubing is available in metric and English sizes, which, clearly, shouldn't be mixed on the same machine.

In automated equipment and machine-shop applications, the outside diameter drives the selection and specification process, matching the tubing to the push lock or other fitting.

If more airflow is needed, larger diameter stock is the obvious choice. Keep in mind, however, that the inside diameter of tubing is affected by the tube-wall thickness, with thick walls reducing ID and airflow.

Hose is sometimes manufactured by adding a nylon braid between the inner and outer layers of tubing and attaching a rigid and a swivel fitting. Whether the hose is made of rubber or lighter-weight polyurethane or other materials, it is strong, flexible, and kink resistant—and, therefore, an easy way to connect shop air to blow-guns or other pneumatic tools.

Hoses are commonly available in diameters of 1/4-in., 3/8-in., and 1/2-in. with national pipe thread (NPT) or quick-disconnect fittings (QD). To ensure proper airflow for an application, check diameters carefully.

Material types

Several materials are used to produce extruded-plastic pneumatic tubing including:

Polyurethane tubing is strong and has excellent kink resistance compared to other types. With a working pressure of 150 psi or higher, it's the most commonly used tubing material. It also has

tight OD tolerance, and a wide range of available push-to-connect fittings. Note that a number of tubing colors and diameters are offered to help identify pneumatic circuits. UV stabilization is an option for outdoor use.

Polyurethane and PVC tubing are the most flexible materials available. Polyurethane tubing is very durable with outstanding memory, making it a good choice for coiled, portable, or self-storing pneumatic hose applications. PVC is not as tough as polyurethane, but can be specified for food-grade applications. It's also a good choice when high flexibility and low cost are required.

Nylon and polyethylene tubing use harder plastics and, thus, are less flexible. This makes these material types a good choice for air distribution and straight-run piping applications. Notable nylon-tubing properties include high working-pressure capability (to 800 psi), a temperature range to 200 F, and excellent chemical resistance.

PTFE tubing has several notable properties of its own, including high heat resistance, excellent chemical resistance, and good dielectric properties. PTFE tubing can handle temperatures as high as 500 F, is chemically inert, and can be used in applications sensitive to static electricity.