How compressed air is made

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Compressed air is made of the same air you breathe in and out, but that air is compressed into a smaller size and kept under pressure. When you take atmospheric air and physically force it into a smaller volume, the molecules take up less space; voila, the air is compressed.

Step 1: Air is trapped in a cylinder, tank, or similar containerStep 2: The space in that container becomes smaller, which forces the air molecules closer together

But pistons aren"t the only way to force air into a smaller space. There are numerous styles of air compressors on the market, each with its advantages and disadvantages. For example, rotary screw air compressors use dual spinning screws to push air down and compress it:

Rotary screw air compressors are chosen over reciprocating because they are compact, powerful, and can run continuously. If you"re interested, you can read more about the differences between rotary screw and reciprocating air compressors here.

You know when you"re crammed in a busy elevator, the door suddenly opens, and everybody rushes out and spreads apart? Compressed air does the same thing. While the molecules in air can be trapped in a smaller space, they don"t want to be, and they will spread apart as quickly as possible the first second they can. That"s what causes pressure.

Atmospheric air has 14 PSI of pressure (1 bar) but can be forced up to 6004 PSI (414 bar) of pressure when compressed into a smaller state. Exactly how pressurized compressed air becomes is determined by science.

Collectively, these three laws explain that pressure, volume, and temperature are proportional. If you change one variable, then one or two of the others will also change, according to this equation:

When applying this formula to an air compressor, the air volume and pressure can be controlled and increased as needed. You can use compressed air in pressure ranges from 14 PSI to 6004 PSI (1 to 414 bar) at flow rates from as little as 3.5 CFM (0.1 m?) and up.

Fortunately, most people have no reason to memorize or use this formula. Instead, just set your air compressor to your desired pressure and let science take care of the rest.

Compressed air is hot because the air molecules are physically forced closer together during compression, which causes the molecules to move quickly; this rapid molecule movement generates heat.

Depending on the application, the compressed air that leaves an air compressor system can be hundreds of

degrees. However, the compressed air that leaves an air compressor is typically not as hot as the air inside the compression chamber.

Hot air can be dangerous, and heat also increases the water in the air stream, which can be a problem in some applications. When necessary, air compressor designs can includeaftercoolersto reduce the compressed air temperature, and in turn reduce the amount of water in the air stream.

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