

USES OF COMPRESSED AIR

By Sullair



Industrial facilities use compressed air for a multitude of operations. Almost every industrial facility has at least two compressors, and in a medium-sized plant there may be hundreds of different uses of compressed air.

Uses include powering pneumatic tools, packaging and automation equipment and conveyors. Pneumatic tools tend to be smaller, lighter and more maneuverable than electric motor-driven tools. They also deliver smooth power and are not damaged by overloading. Air-powered tools have the capability for infinitely variable speed and torque control, and can reach a desired speed and torque very quickly. In addition, they are often selected for safety reasons because they do not produce sparks and have low heat build-up, although they have many advantages,

pneumatic tools are generally much less energy-efficient than electric tools. Many manufacturing industries also use compressed air and gas for combustion and process operations such as oxidation, fractionation, cryogenics, refrigeration, filtration, dehydration and aeration. Table 1 lists some major manufacturing industries and the tools, conveying and process operations requiring compressed air. For some of these applications, however, other sources of power may be more cost effective.

Compressed air also plays a vital role in many non-manufacturing sectors, including the transportation, construction, mining, agriculture, recreation and service industries. Examples of some of these applications are shown in Table 2.

Table 1: Industrial sector uses of compressed air

Industry	Example Compressed Air Uses
Apparel	Conveying, clamping, tool powering, controls and actuators, automated equipment
Automotive	Tool powering, stamping, control and actuators, forming, conveying
Chemicals	Conveying, controls and actuators
Food	Dehydration, bottling, controls and actuators, conveying, spraying coatings, cleaning, vacuum packing
Furniture	Air piston powering, tool powering and cleaning, control and actuators
General manufacturing	Clamping, stamping, tool powering and cleaning, control and actuators
Lumber and wood	Sawing, hoisting, clamping, pressure treatment, controls and actuators
Metals fabrication	Assembly station powering, tool powering, controls and actuators, injection molding, spraying
Petroleum	Process gas compressing, controls and actuators
Primary metals	Vacuum melting, controls and actuators, hoisting
Pulp and paper	Conveying, controls and actuators
Rubber and Plastics	Tool powering, clamping, controls and actuators, glass blowing and molding, cooling
Stone, Clay and Glass	Conveying, blending, mixing, controls and actuators, glass blowing and molding, cooling
Textiles	Agitating liquids, clamping, conveying, automated equipment, controls and actuators, loom jet weaving, spinning, texturizing

Table 2: Non-manufacturing sector use of compressed air

Industry	Example Compressed Air Uses
Agriculture	Farm equipment, materials handling, spraying of crops, dairy machines
Mining	Pneumatic tools, hoists, pumps, controls and actuators
Power generation	Starting gas turbines, automatic control, emissions controls
Recreation	Amusement parks – air brakes Golf courses – seeding, fertilizing, sprinkler systems Hotels – elevators, sewage disposal Ski resorts – snow making Theaters – projector cleaning Underwater exploration – air tanks
Service Industries	Pneumatic tools, hoists, air brake systems, garment pressing machines, hospital respiration systems, climate control
Transportation	Pneumatic tools, hoists, air brake systems
Wastewater treatment	Vacuum filters, conveying