

The role of booster compressors in the production of PET bottles

Polyethylene terephthalate (PET), polyethylene (PE), polypropylene (PP) and polycarbonate (PC) plastic types are commonly used in the manufacture of various forms of plastic containers and bottles. For filling carbonated drinks and beverages, PET is the most suitable choice. This article looks at how booster compressors can help with PET bottle manufacture. Read on to find out how PET bottles are made.

PET bottle production

PET bottles are manufactured by blow moulding technology. Reheat blow moulding, reciprocating blow moulding and extrusion blow moulding are the most common blow moulding techniques used in the production of PET bottles.

Reheat blow moulding

This bottle manufacturing process uses a reheat blow moulding machine (RBM). It starts at the injection moulding stage, where molten plastics are injected into a multi-cavity mould. They take the form of elongated tubes with a neck and threads to fit the cap. These tubes are generally referred to as parisons.

These tubes are then loaded into a blow moulding machine for reheating and blow moulding. A quartz heater reheats the bottle blank; while the mandrel feeds pressurised air into the mould after it has been slid through the neck of the bottle into the blank. This stretch blow moulding results in a biaxially and radially oriented plastic bottle with a carbon dioxide barrier suitable for storing carbonated drinks. The product is cooled indirectly with water or

directly with pressurised air or carbon dioxide. Please note that the bottle forming stage and the reheating and blow moulding stages are two separate processes.

Reciprocating blow moulding

Using reciprocating blow moulding machines, this PET bottle production technique is similar to the one described above. However, it pushes the accumulated injection onto the mandrel to form the mouth of the bottle.

Extrusion blow moulding

This manufacturing process incorporates both blank formation and blow moulding into a single process. It utilises a single extruder that continuously produces vertical blanks with a wall thickness that is varied by the orifice from which the blanks are extruded. This variation in wall thickness ensures uniformity throughout the moulded PET bottle. In addition, the fabricated bottles are cooled in a similar manner to that described above.

What is polyethylene terephthalate?

Polyethylene terephthalate, also known as PET, is a thermoplastic polymer produced by the reaction of ethylene glycol with terephthalic acid. Depending on its material composition, it can be transparent or opaque. In addition, it is often polymerised to produce a long chain of hydrocarbons to enable the manufacture of PET bottles.

The polymerisation of PET sometimes produces impurities. Two typical impurities are diethylene glycol and acetaldehyde. Acetaldehyde is not only produced during the polymerisation process, but also during the manufacture of PET bottles. If it is produced in large quantities in the PET used to make the bottles, it can give its contents a strange taste.

The role of the compressor

Of all the components in the PET blow moulding industry, compressors are the most important. They must therefore be handled with great care and given the utmost attention throughout the process. Their importance is a result of the pressurised air that needs to be injected to form and shape the PET bottle. In addition, the extreme temperature and pressure conditions over a long period of time during the manufacturing process require an exact flow of air within the system. This role is played by the compressor, thus emphasising its importance to the success of the process.

What is a high pressure booster compressor?

Equipment that amplifies the pressure of pre-compressed air in an industrial system is known as a high-pressure booster compressor. This system takes air from a low pressure compressor and multiplies it to produce higher pressure air. A standard high-pressure booster compressor can amplify the pressure of pre-compressed air by a factor of ten.

Types of PET air compressor systems

PET air compressor systems are available in different variants for the PET bottle process. These systems facilitate the manufacture of high-pressure plastic bottles. The main categories include

Air-cooled pistons with three-stage lubrication

Single-stage boosters

Single-stage boosters

High pressure four stage centrifugal

Three-stage water-cooled piston

Three-stage lubricated air-cooled piston

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