

INGERSOLL RAND WHITE PAPER | AUGUST 2023

# High-Quality Compressed Air for the Fabricated Products Industry





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## Introduction

Plastic fabrication is the process used to design, manufacture and assemble products made from plastic or composites. The rise in demand for these products has increased over the past several decades. Plastics have become an integral part of our everyday lives in the products that we use, like packaging, automotive parts and construction materials. These products are cost-effective, extremely strong and recyclable.

Plastic fabrication is a very lucrative business. The global plastic market size was valued at 439.28 billion USD in 2021 and is projected to grow from 457.73 billion USD in 2022 to 643.37 billion USD by 2029, exhibiting a CAGR of 5.0% during the forecast period (Source: Fortune Business Insights).

Precision, reliability and energy efficiency play a crucial role in its success. The quality of fabricated plastic products is extremely important as well. Manufacturers cannot produce products with uneven thicknesses, defective shapes or sizes. To ensure high quality products are produced during the manufacturing process, air compressors are used to provide a consistent delivery of power needed to keep manufacturing systems operating smoothly.

## Compressed Air in the Fabricated Materials Industry

Compressed air can be considered the main power source in manufacturing. Processes used in plastic fabrication, like molding bottles and containers or conveying food trays would be slow and inefficient by today's standards if not for the power of air compressors.

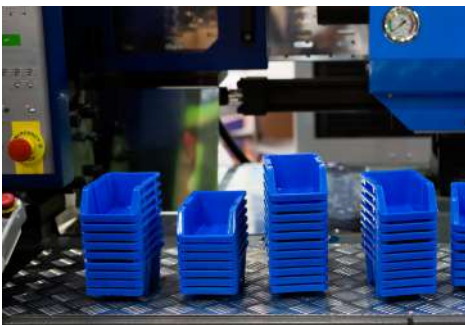
Apart from the importance of compressed air for improved energy efficiency, the appropriate compressed air quality helps avoid problems while producing the final product. By following the right requirements, the plastics industry can reduce costs and avoid production standstill.

Compressed air is a critical component in many processes throughout the plastics manufacturing process - here are a few examples:



### Cooling

Compressors are used throughout the plastic-forming process. When a material becomes hot, it needs to be cooled down to harden and form into the product it is to become. Compressors are often used to help the cooling and molding processes.



### Thermoforming

This process turns plastic sheets into three-dimensional shapes, like plates or trays. A plastic sheet is heated so that it can be formed into the final product by a compressor, blower or vacuum pump.



### Molding

When it comes to manufacturing bottles and containers, compressors and blowers are used in the molding process. Plastic is placed in a mold formation of the product that is being manufactured. A blower discharges compressed air through a tube-like filter towards the plastic. The air emitted from the blower cools the plastic, allowing it to harden before it is removed from the mold.

## Choosing the Right Compressor

Choosing the right compressed air system is determined by your current process workflow. This means that the air compressor or compressors should be able to handle the requirements of all equipment used in plastic fabrication. When compressors do not supply enough air to meet the demands of your equipment, you can experience a significant amount of production downtime and lost product. Compressed air systems ensure operational efficiency.

Before purchasing a compressor, it is necessary to consider several factors, including a compressor's air volume (cfm), air pressure (psi), and horsepower (hp), as well as the size of the associated receiving tank. Other considerations include how to handle contaminants and moisture in the system, and whether to use a single-stage or two-stage compressor to meet your application's needs.



### Compressor Technology

- How much airflow is required?
- How many hours will the compressor operate each day?
- Will the flow demand fluctuate?
- Are there any space constraints?
- What are the pressure requirements?
- Is noise a concern?

### Air Quality

- How clean or dry does my air have to be?
- Which filters or dryers do I need?

### Systems Approach

- Are you going to expand your operation in the future?
- Do I need external help with parts and maintenance?

Once you answer these questions, you should be well on your way to deciding which compressor is right for you.

## Matching Your Demand to Compressor Technology

Choosing the right compressor boils down to one important factor – you must match your compressor technology to meet your specific application needs. Ingersoll Rand offers a broad portfolio of oil-flooded compressors in two technologies that are sure to meet virtually any requirement in the plastic fabrication industry. Our team of knowledgeable experts will help you find the solution among our innovative air products and services to keep your business operating at full capacity.

### Oil-flooded Rotary Compressors

Oil-flooded rotary compressors are the most efficient on the market. They have the highest initial cost but can lower your total cost of ownership over the life of your compressor by reducing energy use, especially when a variable speed drive (VSD) model is purchased that automatically adjusts its compressed air output to achieve the highest efficiency for your operation. Rotary compressors:

- Offer a wide product range from 4 to 100 kW or more
- Are available in oil-flooded models
- Operate quietly
- Have the highest initial cost, with lower lifecycle and energy costs



### Reciprocating Compressors

Ingersoll Rand offers single- and two-stage reciprocating compressors, available in both oil-free and oil-flooded models. They are a perfect choice for lower demand applications that require a reliable air supply for everyday use. Although noisier than some other compressors, it is a true workhorse with unsurpassed performance by maximum operating pressure, increased air flow and extended duty cycles. These compressors offer:

- Products that range up to 20 kW
- 100% continuous duty for maximum power and flexibility
- Easy to access components that simplify maintenance and service
- Lowest initial cost



### Scroll Compressors

When quiet operation, low maintenance and small footprint are critical, scroll air compressors are the best choice. Their compact and innovative design makes them ideal for small commercial applications where clean, reliable, oil-free air is required. Advantages of scroll compressors include:

- Products that range up to 30 kW
- 100% oil-free
- Smaller footprint
- Mid-priced initial cost



## More Than Just Choosing the Right Compressor

Moisture and contaminants in compressed air can produce significant problems in equipment, like rust, scale and clogged orifices that result in reducing operational efficiency. Making air treatment equipment an integral component of your compressed air system will improve productivity, system efficiency and product or process quality.

### Air Dryers

Excessive moisture causes damage to your compressed air system, which can impact the entire operation of your plastic fabrication manufacturing facility. At Ingersoll Rand, we understand that air quality is a crucial aspect of success. This is why we offer a wide range of high-quality air treatment equipment to enhance your air compressor system by improving productivity and efficiency as well as making the overall running of operations more manageable.



### Air Filters

By pairing your compressor system with the proper inline air filter, you can protect both your tools and employees from harmful contaminants by effectively removing solid particles, water, oil and aerosols from compressed air. With a rugged, durable design and easy maintenance F-series advanced inline filters will provide years of reliable performance by reducing contamination in your air stream.



## On-site Nitrogen Generation

Ingersoll Rand's on-site nitrogen generators offer quality and reliability so that you can focus on maximizing the productivity of your operations. To simplify your business processes, our efficient designs generate nitrogen from freely available air and allow you to forgo traditional nitrogen delivery. Combined with our line of complementary products, you can get the peace of mind from having your entire nitrogen production process backed by a trusted partner from start to finish.



## Find A Service Partner You Can Trust

Ingersoll Rand is your trusted partner for the long haul. We take a systems approach, providing expert services that go beyond providing just a compressor. Our services include skilled project management, installation for start-up, system expansion or decommissioning, as well as flexible maintenance programs that meet your specific requirements.

We work with you to enhance your operation's compressed air system by adding additional high-quality, low-cost critical equipment; running consultations; as well as maintaining your system to ensure that it runs at performance.



## Protect Your Investment with Ongoing Preventative Maintenance

Ingersoll Rand offers a variety of high-quality parts and maintenance kits with everything you need to run preventative maintenance yourself. We also offer maintenance services and CARE programs, like PartsCARE to ensure you always have the quality OEM parts you need for basic maintenance and PlannedCARE for trained technicians who are always ready to help you.

Our main goal is to offer you the highest efficiency and quality while supporting your business with the very best equipment, accessories and service repair at the lowest possible cost.

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