As a supplier of industrial gases, supply systems and related services to the tire industry, Praxair understands how important it is for tire manufacturers to maximize their offerings and improve production capacity and efficiency. We have a team that can help you evaluate your tire manufacturing process and work with you to design a system that meets your needs.

The full line of industrial gases includes nitrogen, which is mainly used in tire manufacturing applications. Praxair gases are available in a wide range of supply options including bulk, cylinder, pipeline, on-site and high-pressure systems to meet various levels of gas usage.

**Tire Curing**

Tire curing is the process of applying pressure to a tire in a mold to give it its final shape. The uncured tire, also referred to as a “green tire”, requires pressure to be applied to stimulate the chemical reaction between the rubber compounds. Steam is commonly used, but there are issues with heat concentration, pressure control and operating costs. Nitrogen can be used to provide more stable pressure, increased uniformity, balance and quality. Overall, the tire curing process formulation is specific to pressure, temperature and time.

Nitrogen provides significant benefits over steam use. These benefits include:

- **Better Temperature/Pressure Control**: Steam systems are more difficult to control. Nitrogen allows for individually controlled curing temperature and pressure resulting in better quality and lower scrap rates.
- **Cycle Time Improvement**: Cooler temperatures allow for quicker turnaround.
- **Elimination of hot water system**: Hot water systems are used in steam processes. They can be expensive and require extensive maintenance leading to operational down time.
- **Increased Bladder Life**: Nitrogen is inert and eliminates high levels of oxygen and other contaminants that may affect bladder integrity.
- **Cleaner Option**: Using steam requires a wastewater removal process and/or chemical disposal. Using nitrogen eliminated the need and provides you with a cleaner option.
Tire Inflation

For most people, air is what is commonly used to inflate tires, but nitrogen has also been used for many years and has the additional benefits of being an inert gas that does not support moisture or combustion. This is especially important in the tires of vehicles that require a certain degree of precision in tire pressure and fill, such as race cars, industrial machinery and aircraft, but there are also benefits to providing consumers with nitrogen for common car use. These benefits include:

- **Consistent Fuel Economy:** Driving with the correct air pressure may result in better fuel economy. Nitrogen stays in tires longer, reducing the frequent need to check them and keep them properly inflated.

- **Enhanced Tire Performance:** Nitrogen filled tires exhibit less pressure change with temperature swings. That means more consistent inflation pressures as the tires heat up.

- **Reduced Humidity Levels:** All water and water vapor should be avoided inside a tire. Air contains water vapor that can contribute to pressure changes and can also promote corrosion in the wheel. Nitrogen gas is dry and does not support moisture that could contribute to corrosion of the steel components in the tire.

- **Permeability Advantages:** Nitrogen molecules are larger than oxygen molecules, which makes it more difficult for nitrogen to leak out of tires. Even though nitrogen and oxygen can and will eventually find their way through the tire’s inner liner, it can take up to six times longer for nitrogen verses oxygen.

- **Other Transportation Applications:** Other than automotive, tires for aircraft, mining equipment and commercial/heavy trucks use nitrogen.

The Praxair Approach

Praxair offers more than just gases and is committed to making sure your supply system, installation, and on-going product deliveries meet your expectations. If you’re looking to improve the energy efficiency and cost savings of your tire manufacturing operation, visit us at [www.praxair.com/auto](http://www.praxair.com/auto) or call 1.800.PRAXAIR to learn more.