

# Nitrogen in Aerospace Applications



In aerospace industrial production, safety is a major and long-standing issue to be faced. Thanks to nitrogen, an inert atmosphere can be maintained, preventing the possibility of combustion. Therefore, nitrogen is ideal for systems that operate at high temperatures or pressures, such as industrial autoclaves. In addition, unlike oxygen, nitrogen is less likely to penetrate materials such as seals or rubber, which are common in various aircraft components. For large and expensive aerospace workloads, using nitrogen is the only answer. It is an off-the-shelf gas that not only offers a variety of industrial and commercial advantages in manufacturing, but is also a cost-effective solution.

How is nitrogen used in aerospace industry production?

Because nitrogen is an inert gas, it is particularly suitable for the aerospace industry. The safety and reliability of various aircraft components and systems is a top priority in this field, as fire can pose a threat to all parts of the aircraft. Using compressed nitrogen to combat this obstacle is just one of the many ways in which it can be very beneficial. Read on to discover some of the more important reasons why and how nitrogen is used in aerospace industry production:.

**Inert Aircraft Fuel Tanks:** Fires are a common problem in aviation, especially in relation to fuel tanks carrying jet fuel. To minimize the potential for fires in these aircraft fuel tanks, manufacturers must reduce the risk of flammable exposure through the use of fuel inerting systems. This process involves preventing combustion by relying on chemically non-reactive materials, such as nitrogen gas.

**Damping Effect:** Landing gear hydraulic struts or hydraulic devices used as shock springs in aircraft landing gear have an oil-filled gas cylinder that is slowly filtered into a perforated piston during the compression process. Typically, nitrogen is used in shock absorbers to optimize damping efficiency and to prevent the oil from "dieselizing" on landing, unlike in the presence of oxygen. In addition, because nitrogen is a clean and dry gas, there is no moisture that could cause corrosion. Compared to air containing oxygen, the nitrogen permeation rate during compression is greatly reduced.

**Inflation systems:** Nitrogen has non-flammable properties, making it ideal for inflating aircraft slides and life rafts. Inflation systems work by pushing nitrogen or a mixture of nitrogen and CO<sub>2</sub> through pressurized cylinders, regulating valves, high-pressure hoses and aspirators. CO<sub>2</sub> is often used in combination with nitrogen to ensure that the valves do not release these gases too quickly.

**Aircraft Tire Inflation:** When inflating aircraft tires, many regulatory agencies require the use of nitrogen. It provides a stable and inert atmosphere, while also eliminating the

presence of moisture in the tire cavity and preventing oxidative degradation of the rubber tire. The use of nitrogen also minimizes wheel corrosion, tire fatigue and fires caused by brake heat transfer.

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