

Application of autoclave on-site nitrogen generator



Autoclaves are widely used in the curing process in the industrial market. Certain chemical and atmospheric conditions need to be maintained - i.e. oxygen must be removed. If oxygen is introduced or present during and after the product curing process, it may cause combustion of the remaining composites in the autoclave container. The solution is to purge the inside of the autoclave with completely inert nitrogen after each curing.

Installing a field nitrogen generator for an autoclave is an obvious choice because it can reduce production costs and improve the operational safety and efficiency of your facility. Read on to learn how the nitrogen generator is used to clean the autoclave.

How are autoclaves used in various industries?

Autoclaves are used in many different industrial and chemical applications that require high temperature and pressure to cure various components safely and quickly. Depending on

the size and content of the load, it may take anywhere from 15 minutes to several hours to complete the curing process.

Autoclaves are used for the following applications:

Rubber vulcanization. Vulcanization is the process of using certain chemicals (such as sulfur) to harden rubber. Autoclaves are the perfect containers for this process because they have the ability to regulate high temperature and high pressure conditions.

Polymers are substances that are bound together by similar material compounds. Polymers are used in many different industrial applications, initially as liquids, and then hardened to form a uniform film or protective coating. Autoclave polymer curing is used to ensure consistent and high-quality results of polymer products used in various industrial applications.

Autoclaves are used in the curing process of artificial crystals in electronic manufacturing because they are the only system that can produce the high temperature and high pressure levels required to manufacture high-quality crystal products.

How does the autoclave work during curing?

Autoclaves use pressurized heat to cure various materials at extremely high temperatures. The autoclave curing process involves several stages.

First, there is a loading period during which the container is filled with material that needs to be cured.

Next, turn on the heating and pressure system to heat the device and pressurize the autoclave to the required pressure with nitrogen atmosphere.

During this process, the temperature increases gradually until it reaches the required level. The temperature then stabilizes for the specified duration. Once the time is up, the

container begins the cooling phase, after which the nitrogen atmosphere in the chamber is depressurized and the items can be safely removed.

Why is nitrogen the ideal choice for autoclave curing?

Nitrogen is an inert gas. It is used to stabilize the internal components of the autoclave before and after each curing. This is crucial because autoclave chambers are usually composed of a variety of chemicals and composites, which can become highly flammable or dangerous if they come into contact with certain substances, especially oxygen.

Nitrogen is used to purge the autoclave chamber to prepare for material curing, and then maintain nitrogen atmosphere in the autoclave during the whole curing process.

How is the nitrogen generator used to clean the autoclave?

According to the requirements of nitrogen purity, both membrane and PSA nitrogen generators can play an important role in the curing process of autoclave. Installing a field nitrogen generator for purging the autoclave is a more practical and economical nitrogen supply option. Another method is to transport pressurized nitrogen tanks to your facility on a regular basis, but delivery may be unreliable and costly. Any time there is a delay or the fuel tank must be replaced, it will cost your facility funds.

Field production of nitrogen ensures consistency, safety and cost savings. It also eliminates the need to transport nitrogen tanks, reducing the environmental impact of your operations. The on-site nitrogen generator generates a continuous supply of nitrogen, so there will never be a risk of exhausting inert gas at an untimely time. This means that your facility will not shut down (at least not because of nitrogen deficiency), and more importantly, it significantly reduces the risk of oxygen related autoclave combustion.

With proper maintenance, the nitrogen generator can be used for ten years or more even if it is used continuously.

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