AUTHORED ARTICLE

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How quality compressed air powers the intricate processes in the pharmaceutical industry

The pharmaceutical industry has always played a very pivotal role in providing quality healthcare services which was realized even starkly during the pandemic time. It forms a very vital part in the healthcare industry as it continually works towards curing and enhancing the human health. Across the globe, pharmaceutical is one of the most strictly regulated industries, and India stands at 3rd position for pharmaceutical production globally which necessitates the industry to pertain to the highest industrial standards. The production of quality drugs and medicines effectively requires quality compressed air at every step of production.

Pharma manufacturers must employ dry compressed air to provide a wide range of production activities. Even the Food and Drug Administration (FDA) relies on air compressors to render high-quality end products that comply with the industry standards.

Considering the wide range of applications compressed air finds in the processing, manufacturing, and packaging of pharmaceutical products, it becomes imperative to check for any presence of moisture in the compressed air. Compressed air drives the pneumatic process essential for the manufacturing of capsules and tablets and gives the required texture, color, and flavor to the tablet. It regulates the right balance of ingredients and prevents the contamination of products. The presence of moisture in any of the processes can contaminate the air and compromise the quality of the product. The role of compressed air is not just limited to the manufacturing of tablets, but it is even used in the manufacturing of liquid medicines where it monitors the measurement of formulas, purification

Desiccant Dryer for Pharmaceutical Industry

from any contaminants, and is equally important for the manufacturing of syrups, gels, ointments, and creams.

The moisture in compressed air changes the color coating of the tablet. It can cause unwanted chemical reactions and even account for blisters in tablets as well as result in breakage of the tablets. Moreover, the pharmaceutical products being inherently hygroscopic in nature have the tendency to undergo physical, enzymatic, microbiological, and biochemical deterioration by coming in contact with the moisture-contaminated compressed air.

The issue of moisture is not just limited to the quality of end products but it can lead to malfunctioning of pneumatic tools and machines. While causing pipelines, cylinders, and other components to corrode, moisture also intervenes with the operations by leaving behind a sluggish and inconsistent functioning of pneumatic valve and cylinder. The problem is compounded when the moisture freezes when exposed to cold weather. All the factors cumulatively result in the high maintenance cost of the pneumatic machines.

As compressed air powers the various intricate processes in the pharmaceutical industry, the quality of the air must be closely monitored and ensured that it is free from any form of contaminants like moisture/water, oil fumes, dust particles, or any form of solid contaminants. Even the minutest presence of contaminants in the compressed air can adversely result in the generation of substandard finished products.
To meet the highest compressed air quality, efficient compressed air dryers must be installed for the treatment of compressed air in the manufacturing and packaging units of various pharmaceutical processes. Delair is one such company that comes with end-to-end Compressed Air Treatment solutions and offers a wide range of refrigeration and desiccant/adsorption dryers. Both types of dryers have different principles for drying but give the same result of eliminating moisture from the compressed air and their application depends upon the specific demand of the particular process.

The processes which require pressure dew point between 3°C- 6°C employ the refrigeration dryer where the air is dried by cooling it down to nearly freezing point. By doing so the moisture of the air is removed. On the other hand, to achieve extra dry air where atmospheric dew point of (-)40°C to (-)60°C is required, adsorption or desiccant drying is applied. It employs the principle of heatless regeneration where desiccants are deployed to adsorb and desorb the water vapor. It takes leverage of the pressure swing principle/ purges air to revive the desiccant bed.

Therefore, compressed air-drying systems can be considered to be the supporting structure that ensures the compressed air meets the pharmaceutical air standards. It plays an essential role in removing any sort of contaminants present in the compressed air that not just helps in generating quality finished products, but makes sure that the pneumatic machines function properly.