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Innovative vacuum solutions in pharma industry

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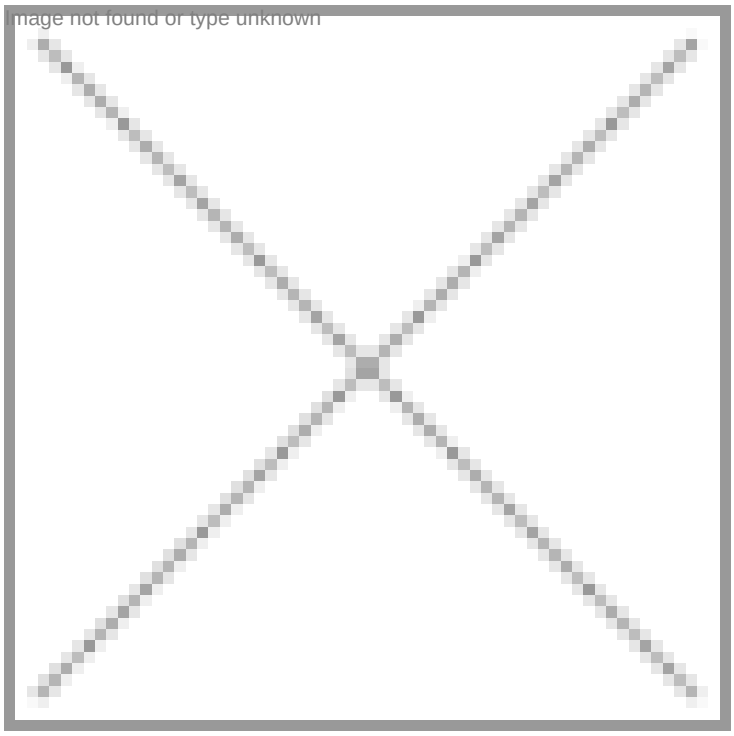

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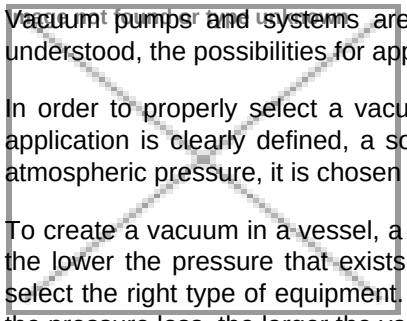

Vacuum pumps and systems are common across a tremendous range of industries. Once the essential principles are understood, the possibilities for application become apparent.

In order to properly select a vacuum system, the principles of basic vacuum technology should be understood. Once the application is clearly defined, a solution can be found by applying these methods. Since we understand and can relate to atmospheric pressure, it is chosen as a reference point. Vacuum is simply a pressure that exists below atmospheric pressure.

To create a vacuum in a vessel, a vacuum producing device needs to remove mass from it. The more mass that is removed, the lower the pressure that exists inside the vessel. This is why it is important to understand what vacuum is and how to select the right type of equipment. It is very important to size vacuum piping correctly to minimize pressure loss. The greater the pressure loss, the larger the vacuum equipment needs to be.

The type, quantity of gas handled, and the operating pressure, normally defines what vacuum pump can be used. If the gas consists of mainly non-condensable, then most types of pumps can be used. If the gas consists of non-condensable and condensables, then the choices will be limited. Therefore a right solution considering the load of condensable and ultimate vacuum should be struck.

System selection

To select the best type of system for a particular application, several parameters need to be considered. They include operating cost, solvent recovery, effect on process, materials of construction, operating range, reliability, waste generation, pollution abatement, emission reduction, maintenance cost, ease of cleaning, serviceability and purchase price. After this the vacuum pump that best meets these criteria may be selected.

Pharmaceutical industry

The pharmaceutical industries use vacuum for distillation and drying. Various types of dryers are used to purify products under vacuum. The chemicals are precisely mixed and then heat is applied in the dryer to evaporate the excess chemicals. This is done under vacuum for purer end products; reduce the amount of heat energy required for drying, and also to recover any of the solvents evaporated off thereby not affecting thermally sensitive products. Pumps that are reliable and easy to service in the field are the most important for this industry. If an unreliable pump is tried and it fails in the middle of a drying cycle, then the product is not useable and profit is lost.

A typical setup used for this application is combining mechanical roots blower along with oil lubricated vacuum pump. This kind of setup is used to minimize utility costs, drying cycle time and contamination. A properly designed process condenser between your vacuum process and vacuum producing system will yield significant advantages. A process vacuum condenser can significantly reduce the size of the vacuum producing system, recover for reuse valuable product carried from your process with non-condensable gases, reduce amount of wastes produced by the vacuum system, and lower the operating cost of your process.

Matching a vacuum condenser with the vacuum producing equipment is the best way to meet the objectives of process. Toshniwal manufactures both the process condenser and the vacuum producing equipment. This single-source responsibility provides you with a unitized system matched to the process.

Toshniwal Systems & Instruments, Chennai