

SUPPLIERS' TIPS

What are some commonly overlooked dryer maintenance steps?

In general, dryers for bulk solid materials are reliable machines. However, certain points should be checked regularly to ensure reliable operation.

Vacuum dryers are equipped with a dust filter, which separates the vapors from the entrained solids. Even if the filter is cleaned by back-flushing, the pressure difference across the filter should be monitored quite carefully. Partially blocked filters might cause a high pressure drop and worsen the vacuum in the dryer. This can generate lower drying times or more thermal stress on the material.

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Furthermore, the shaft seals of dryers with rotating mixing elements should undergo regular maintenance to avoid leakage, which can lead to product emissions. For instance, in cases where vacuum is applied to a machine with leaky seals, gas streams are produced that create additional loads in the vacuum pump. Typically, simple seals like stuffing boxes need more maintenance than more complex types like mechanical seals.

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When considering commonly overlooked dryer maintenance steps for a spray dryer, one thing that's most often neglected is an assessment of wear and tear on the dryer's nozzles. These nozzles are exposed to materials of varying degrees of corrosiveness, heat, and abrasiveness, so it's important to check them before each project. This is a quick and easy step that involves using a pin gauge to calibrate the nozzle and ensure the correct diameter of the orifice opening.

Using a standardized pin gauge allows the engineer or operator to assess how easily the pin fits into the central hole on the orifice disc; the pin should be able to fit with little or no external force. To properly gauge the orifice opening, two pins are needed: a *go pin* and a *no-go pin*. The *go pin* would be used for the absolute lower limit and should easily fit into the central hole. The *no-go pin* would be used for the absolute upper limit.

In addition to nozzle orifice maintenance, keep in mind that the nozzle in a spray dryer comprises many parts:

1. The **carrier**, which is the outer portion of the nozzle that screws into the body.
2. The **body**, which is the socket where you place the orifice disc and the swirl chamber.
3. The **orifice disc**, which is a flat circular plate with a single central opening that is used to atomize fluid.
4. The **swirl chamber**, which is a circular tube component that channels fluid through a groove to create a vortex that ultimately passes through the orifice disc's opening.

Proper spray dryer maintenance includes routine cleaning of the orifice disc and proper cleaning of the swirl chamber. Failure to perform proper nozzle maintenance can result in inconsistent atomization, variable particle size, and potential wetting of material that has already been dried in the chamber.

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