SUPPLIERS' TIPS

How can I increase my dryer's product yield?

There are several techniques you can apply to your rotary or flash-drying system to increase product yield and efficiency, including minimizing downtime, increasing insulation use, improving controls, reducing losses, and improving heat recovery and recirculation. The following is a list of suggestions for you to try.

- Minimize downtime for maintenance and repairs by increasing maintenance inspections and upgrading record-keeping.
- Upgrade materials of construction where warranted
- Inspect rotary drying equipment periodically for proper cylinder rotation and excessive wear on the trunnions, thrust rolls, and girth gears.
- Inspect auxiliary equipment, such as fans, motors, and drives, for proper lubrication and settings.
- Improve insulation in the dryer cylinders, ductwork, and associated equipment to reduce energy use.
- Keep operation at steady state to avoid process upsets.
- Have your supplier periodically inspect and clean the dryer burners and replace old burners with updated technology for improved reliability, fuel efficiency, and reduced emissions.
- Operate as closely as possible to your dryer's stoichiometric air and fuel mixture.
- Consider different dryer control parameters. Using humidity instead of temperature to control the gas vent outlet can reduce the system airflow and associated heat losses.
- Lower the gas outlet vent temperature. However, make sure you operate at a temperature high enough to dry your product while avoiding condensation in the off gases.
- Minimize air infiltration (especially in flash dryers) by tightening flanges and making sure all connections and openings are closed.
- Increase the feed temperature.
- Consider using mechanical means, such as centrifugation or filtration, to dewater the dryer feed.
- Use vent gas recirculation wherever possible by returning a portion of the dryer vent gases to the burner air heater.
- Use waste heat from other plant operations in the dryer circuit.
- Increase production capacity by determining any capacity limitations in the fan, burner, dryer, baghouse, scrubber or cyclone.
- Lower the feed moisture.
- Raise inlet air temperatures, but make sure you don't exceed the limitations of the dryer construction or the product.
- Consider system modifications, including revised flighting within a rotating cylinder, an improved feeder, or upgraded seals at inlet and outlet breechings.
- Improve the feed quality by lowering the inlet moisture.

Many of these suggestions will prove useful for increasing your dryer's product yield and efficiency. However, process changes should always be evaluated on an individual basis. In addition, to avoid problems with equipment warranties, unexpected damage to equipment, and undesirable changes in the product quality it's always a good idea to consult with your original equipment supplier before making any significant changes.

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Yield loss in a spray dryer is typically the result of material buildup on the dryer's walls. Material buildup can occur because of insufficient atomization or because the drying chamber isn't designed properly for the atomization type used and the material particle size desired. If your dryer's atomization can't be improved, try modifying the dryer itself or changing the atomization type to improve product yield. For example, if you're classifying or screening the material to remove offsize particles, try using pressure nozzle atomization to improve your product yield. This atomization type produces the tightest particle size distribution compared to other atomization techniques.

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Equipment suppliers are a valuable source of information about equipment and processes. In light of this, we occasionally ask suppliers a question of concern to our readers. Answers reflect the suppliers' general expertise and don't promote the suppliers' equipment. If you have a question you'd like suppliers to answer, send it to Alicia Tyznik, Associate Editor, Powder and Bulk Engineering, *1155 Northland Drive, St. Paul, MN 55120; fax 651-287-5650 (atyznik@cscpub.com).*