VORTRON®

Air Superiority News

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How Air Blow-Off System Design Can Affect Plant Productivity

Management will often decree that new project requirements must meet specific, and seemingly unattainable goals: "Make it 25% faster, with 50% fewer rejects, and lower energy consumption by 30%." How does the facility engineer comply with these goals?

Plant management is far more concerned with "widgets-per-minute" than "kW's-per-widget". In many manufacturing processes such as bottling/canning, product finishing/powder coating, shrink sleeve labeling, or material removal, compressed air blow-off stations represent a large consumer of kW's. Careful attention to the blow-off process in the design phase or as part of a retrofit program can yield annual operational savings year after year. Each blow-off application requires different components and technologies, so each offers different savings opportunities.

Air As A Utility & Energy Savings

As the fourth utility, compressed air is the first place to seek improvement in plant energy savings. Air compressors, the source of compressed air, are not by nature very energy efficient. The initial price of a compressor only represents an average of 15% of its lifetime operating costs: maintenance costs represent 20% and electrical costs represent 65%. Energy costs per year for a compressor can exceed its initial cost.

In most energy audits, a single source represents the biggest power user. In many audits the plant air system is this single source and also the largest source of wasted energy. The two biggest sources of energy waste are: piping leaks and inappropriate uses (i.e. air blow-off).

Air Blow-Off System Design & Plant Productivity

Generally, compressed air blow-off systems either run continuously or are modulated to match a need. Both modes of operation consume large amounts of energy and can cause problems with the compressed air storage system or the line pressure. Compressed air blow-off systems can be the source of line pressure drop-out that can cause pneumatic controllers to malfunction, resulting in costly production down-time and reduced production.

High-efficiency (75 to 79%) blowers are the path to achieving energy savings and productivity gains. A typical compressed air blow-off system designed to flow 120 SCFM at 60 PSI will require 30 HP of compression. This same air blow-off system (2-18" air knives) sized for double the flow can be achieved with a 5 HP high-efficiency blower. In energy savings alone this represents an ***annual savings of $8,000*** at $0.083/kW-hr.

Also, the higher flow will allow for more widgets-per-hour to be processed, thus meeting the primary goal of management. This increase in productivity can be considerable and by itself can justify the cost of installing an air blow-off system.

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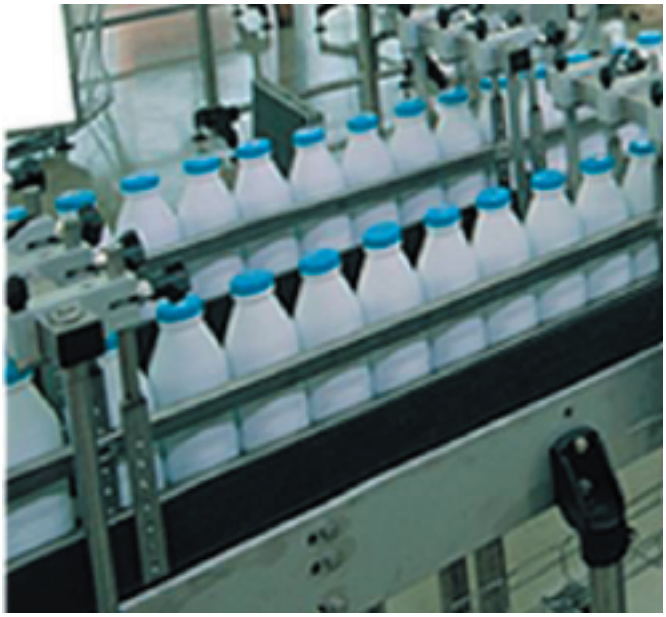
Examples of Air Blow-Off Productivity Gains & Quality Improvements

Product Finishing - Using compressed air guns to remove excess water, a manufacturer of seats for lawn and garden tractors was experiencing a paint line rejection rate of over 15 percent. With 10,000 plus seats per day moving through two robotic paint booths, the 15% rejection rate was unacceptable.

In some blower-based air blow-off systems, rejection rates have plummeted to below 0.005 percent. This type of reduction alone justifies the investment; the energy savings gained by use of a blower in place of the inferior compressed air system is an extra bonus.

Food Processing, Canning - When bottling a chilled product at 40°F, such as apple juice or a dairy-based drink, condensate will form on the bottle's exterior surface. The bottles must be completely dry before labeling. Compressed air type air-knife systems in this type of application will not produce the required results: the bottles will not be moisture-free and the conveyor will not operate at full speed. Any moisture on the surface of the bottle can cause glue to turn milky and/or air bubbles to accumulate, producing a less than desirable product; it will not meet the acceptable standards for presentation.



With the installation of a low-pressure blow-off system, the production of a moisture-free bottle becomes possible, along with a line speed increase of up to 3-fold. As an example, if only the line speed is considered, an increase from 100 BPM to 200 BPM represents a ***doubling of production*** all with acceptable presentation and product quality standards.

Rejected Product Is Costly

Whether you are bottling or canning rejected product due to poor labeling, rusted cans, or failure of packaging, a 1% rejection rate for a 300 BPM line may result in a $400 to $500 per day loss of product or a potential annual loss of $150,000.

Vortron's "New" Home Page

Visit our "NEW" Home Page, www.vortron.com, for more extensive information on AirPower™ high-efficiency blowers and air blow-off systems.

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