

Even heat

Imaginative heat management cuts the processing costs of snacks and spices. Energy efficient steam generators can play a key role.

The facilities:

Two food manufacturers, one working in snacks, the other in spices.

The challenge:

Using heat in their operations processes more efficiently.

The strategy:

Applying heat recovery technology instead of venting hot air outside.

The results:

A payback on investment of less than one year.

Spurred by accelerating costs, processors of all sorts turn to imaginative methods to boost energy efficiency. Two common methods are the recovery and recycling of heat generated during processing; and the use of equipment to keep energy consumption to a minimum without sacrificing superior results.

Toasting corn chips

Among the numerous facilities operated by Frito-Lay, one of the world's best-known snack food manufacturers, is a 350,000-square-foot complex in southern Georgia, where vast quantities of corn chips and snack specialties are produced. Here, gas-fired ovens on three parallel processing lines use heat to toast corn chips. Until recently, however, once its mission was accomplished the heat was simply stack-vented from the plant's roof.

Realizing that the same heat could be recovered, converted to steam, and re-introduced into the plant's main steam supply stream, management thoroughly quantified the energy cost reductions that this would realize, and researched available heat recovery technology.

Clayton heat recovery boilers were installed at Frito-Lay in the fall of 2007. The economies enjoyed as a consequence have confirmed the accuracy of its executives' predictions, and the company's capital investment has already been recouped.

Infrared energy

Meanwhile, at the opposite end of the country, another company has become prominent by introducing improved and highly cost-effective heat transfer technology. MCD Technologies of Tacoma, Washington, manufactures dryers and evaporators that employ the company's patented Refractance Window design to dry food products and nutraceuticals quickly and gently, resulting in superior retention of color, flavor, aroma, nutrients and actives.

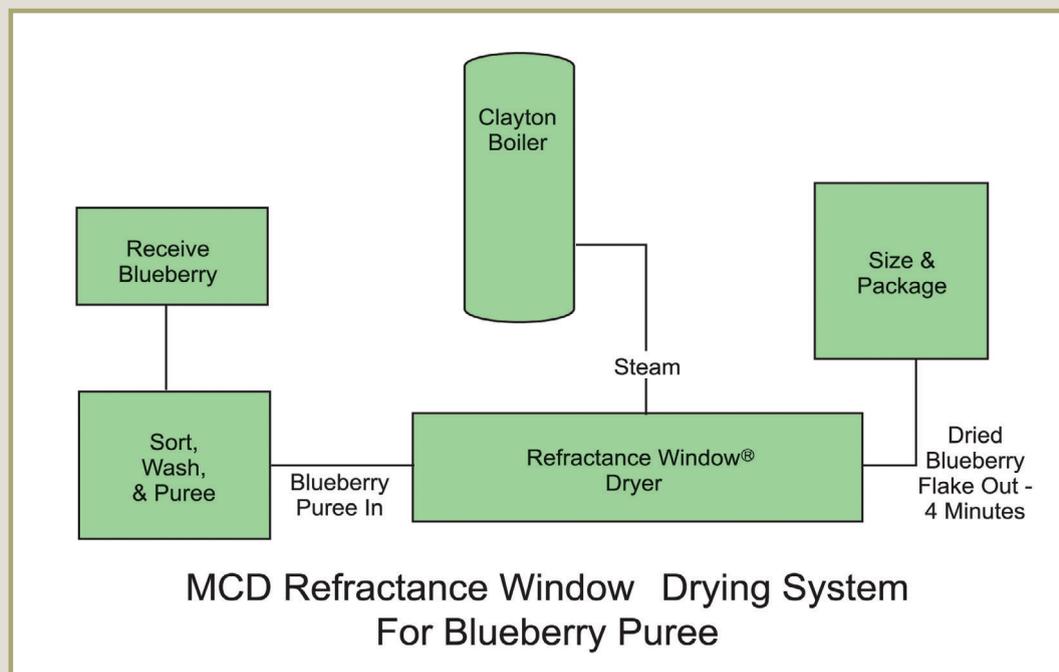
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In addition to selling equipment worldwide, MCD provides custom contract services in its Tacoma plant, including processing, test-drying and scale-up drying. This segment of its business also serves to demonstrate the benefits of Refractance Window operations. To succeed at this, however, MCD needed a source of steam that is dependable, efficient and compact to meet space constraints.

MCD dryers and evaporators cut costs for quality-conscious processors by operating at low temperatures without a vacuum. The Refractance Window technique uses steam to heat the water beneath a continuous sheet of clear plastic. The process allows infrared energy to pass through the plastic with the speed of light and into the moist product atop the belt, which dries rapidly at atmospheric pressure.

The payoff is a modest operational cost and very high retention of desirable properties. Among a myriad of products that benefit from Refractance Window drying are spices and herbs, dairy products, flavorings, fruits and vegetables, meat, poultry, fish, starch and cereals.

MCD says a small footprint was essential for its in-plant steam generator because a designated boiler room would not accommodate a conventional steam boiler of sufficient capacity. The Clayton unit they acquired leaves space for storage in the boiler room, executives say. Equally important, they add, the Clayton steam generator comes up to pressure rapidly, maintains pressure despite demand fluctuations, and is easy to operate and maintain. For more information visit www.claytonindustries.com. ■



It's the Berries! — Typical employment of MCD Technologies' Refractance Window Drying System sees fresh blueberries washed and pureed before placement on a moving sheet of clear plastic. Water beneath the sheet, heated by a steam generator, is the source of ultraviolet energy that dries the moist product with the speed of light. Drying is completed in four minutes.

The snack food company addressed its challenge by contacting Clayton Industries of City of Industry, California, designers and manufacturers of steam generators and heat recovery systems. Clayton's recommendation was three roof-installed heat recovery boilers (an option less expensive than ground installation), each serving its own toasting oven.

The toaster ovens are situated in long conveyor systems that deliver corn chips formed and cut from a batter. Here toasting adds the "crunch" that appeals to consumers, and heat is subsequently channeled to a vertical channel much like an exhaust hood outlet, and introduced into a heat recovery boiler. The heat creates steam in the boiler core. The steam is routed to a remotely located separator, which in turn sends it to the processing supply stream. Processing heat is captured and revives to return as processing heat.