

Blowing-off, drying and shrinking

Precisely targeted hot air

The new filling plant of the established Swiss drinks producer «Elmer Citro» achieves a capacity of up to 20 000 bottles per hour. Prior to labeling the bottles, which have been filled and sealed, they have to be dried. A drying system developed especially for this purpose blows the water away in uniform coalescent drops. Leister Process Technologies, the supplier of the drying system, is the worldwide leader in industrial hot air technology.

PET bottles containing 0.5 to 1.5 litres are filled in the new plant. Speed in filling beverages is of the essence for profitable production. What would the consumer have to say if the drinks bottles just bought in the supermarket were sticky? A product of this nature would be met with general disapproval and would soon have to disappear from the market for hygienic reasons. After filling the beverage and sealing, the bottles are therefore thoroughly rinsed. The subsequent high speed labelling machine must only be loaded with dry bottles.

In view of the high production speed, only very little time is available for reliably drying each individual bottle. It was possible to accomplish this task in next to no time with



system using a purpose-built blow-off nozzle and a Leister AIRPACK blower. An air jet finely concentrated with a nozzle passes by the bottle at high speed so that water drops coalesce evenly and are completely blown away. The gap width of the nozzle can be continuously adjusted to optimise the cross-section of the air jet. The nozzle is made of stainless steel. It is therefore heat resistant, easy to clean and fulfils all the hygiene requirements of the food industry.

Compressed air was very often used especially to dry bottles until now. But compressed air is an expensive medium, whose preparation requires a complex system comprising compressors, compressed air preparation equipment, distribution pipes and fittings. The question also arises whether it is expedient to firstly compress air to a system pressure of several bars only to for it to expand to atmospheric pressure again on exiting the nozzle. The air for this application can be readily provided by a blower-nozzle system at low operational expense. The entire blowing-off system of nozzle, blower and air heater can be integrated in existing filling plants without major expenditure.

Two further process variants are proving themselves in other applications. One is used for simultaneous blowing-off and drying with an additional air heater placed between the blower and the nozzle. With the other one, after blowing off with cold air, any remaining thin water film is dried with an additional Leister blower – air heater combination or a Leister hot air blower. This variant works with a much lower airflow rate, but the air temperature can reach several hundred degrees. The bottle surface is heated such that no more condensed water can form after drying, which would otherwise compromise adhesion of the self-adhesive label.

In a similar way to the bottles, the bottle closures can also be dried with a combination of blow-off nozzle, air heater and blower prior to an inkjet printer applying the production code and the expiry data, for example.

Up to 20 000 PET per hour are bottled on the production line at «Elmer Citro».

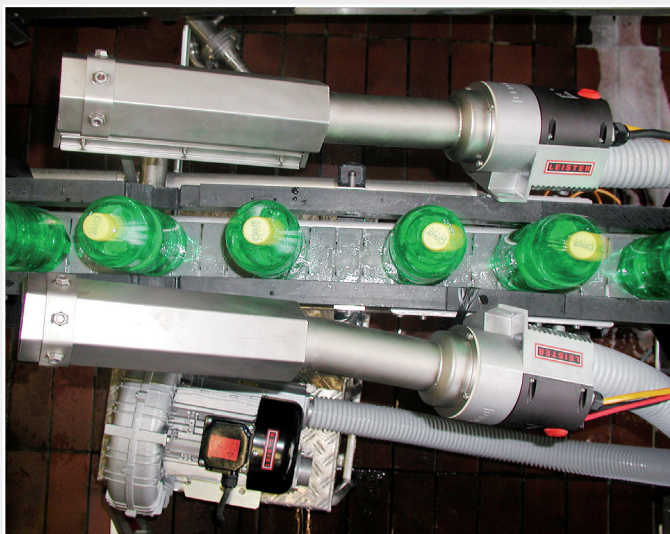
From the CD jewel case to large-scale packaging

Hot air is used for a broad range of applications, especially in packaging technology. For many foodstuffs and innumerable other products, shrink film represents the most consumer-friendly and hygienic form of packaging. Hot air also shrinks the seals on wine bottles and other food packages. Stable shrink films join drink bottles to form easily transportable six-packs. In other applications bulky products are shrink-wrapped on pallets producing stable transport units.

However, not only foils are shrink wrapped with hot air blowers, but also a multitude of other products, e.g. bottle caps, battery packs etc. Shrink films are also used to package CD jewel cases. Films are frequently attached to the product to be packaged in shrink tunnels heated with hot air. An array of plastics are suitable for shrink-wrapping. The risk of delayed shrinkage, e.g. with the use of films with different plasticiser contents, can be minimized by optimising the shrinking process. Leister hot air blowers are very often used even in applications where no hot air is required for shrinking. For example, sleeves or films can be positioned by shrinking before entering the shrink tunnel. The shrinking process within the shrink tunnel can also be optimised with hot air.

Various film shrinking techniques are deployed in industry. Compared with the use of steam to heat the shrink-wrapping materials, hot air has the advantage that higher working temperatures can be generated. Special PET films can be shrink-wrapped more effectively at higher temperatures. Hot air at a precisely regulated temperature produces a reproducible, very efficient shrinking process.

Leister Process Technologies is recognised as the market leader in industrial hot air applications and operates a global network of more than 120 sales and service centres in over 60 countries. The company offers its customers complete solutions including blowers, hoses and temperature regulators for all hot air processes. For instance, the air heater includes integrated heating element protection and an alarm output. It can also be connected to a regulator or a PLC device via a galvanically isolated 4 – 20 mA interface. The power range of the available air heaters is between 400 W and 40 kW; a maximum temperature of 900 °C can be attained. Thanks to their simple construction, the hot air components, such as blowers, air heaters, hot air blowers, nozzles, temperature regulators etc., are well suited for uncomplicated integration in machines and plants.



Blow-off nozzles, air heaters and blower seen from above.

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