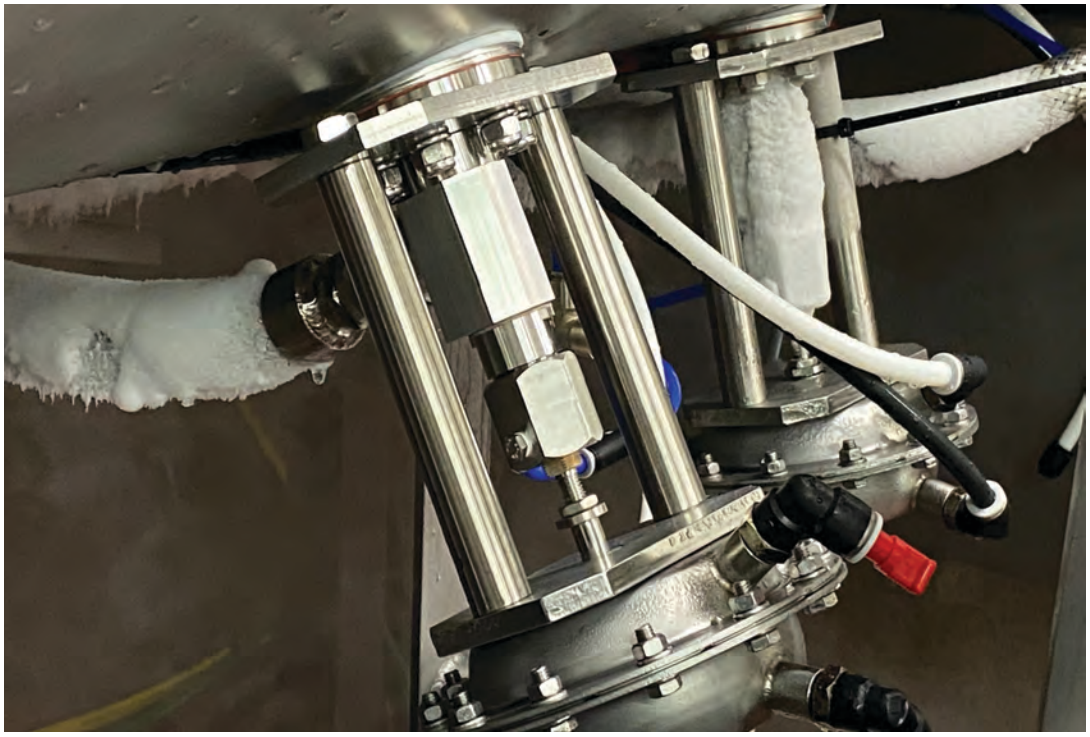
ACCU-CHILL® LXC

Compact bottom-injection system using liquid nitrogen or liquid carbon dioxide



Better quality, lower production costs, food safety, and control over your critical operational control points – these are just some of the demands placed on the food industry and your business. This highly competitive environment demands technology, experience, and skills to deliver profits essential for staying in business.

Injection cooling for batch processing

Bottom injection chilling is a well-established technology to chill food products in blenders, tumblers, mixing vessels and cooking kettles. Food processors that require reducing batch food temperatures during mixing or blending can utilize Linde's ACCU-CHILL LXC bottom-injection system. If the goal of lowering product temperature is to obtain product firmness for forming, or if it is just to reduce product temperature before packaging, then the Linde ACCU-CHILL LXC system can provide you with total control over everchanging production variables. Ideal for chilling meats, seafood, poultry, sauces, soups, thick pastes and bakery dough, ACCU-CHILL LXC establishes a new performance benchmark for this vital processing step.

The LXC system is the difference

The ACCU-CHILL LXC system is a complete application of various interdependent components comprising the entire system with each component playing a vital role.

The Valve – At the heart of the system is the patent-pending valve-nozzle assembly. The valve component is a fail-close, all stainless-steel, inline valve for cryogenic service. The nozzle component automatically closes once the cryogenic liquid has been injected to create a smooth surface along the inside blender wall. This self-closing mechanism minimizes the risk of food particles or residue getting trapped in the nozzle opening and causing cross-contamination between batches. The entire valve-nozzle assembly is pneumatically actuated, compact, robust, and requires the smallest of vessel penetrations. This valve-nozzle assembly functions in the same manner for either liquid nitrogen or liquid carbon dioxide.

The LXC system is the difference (con't)

Cryogen Conditioning Vessel – It takes very little heat to begin turning liquid cryogenics to gas vapor. The vapor has a substantially larger volume than the liquid, yet it carries very little useful chilling energy. As vapor accumulates in the pipeline, the volume flow of useful liquid cryogen drops. A properly conditioned liquid cryogen system is vital to consistent and efficient chilling of the product in the mixer. Poorly conditioned cryogens can require multiple batch temperature checks with additional cooling steps leading to extended batch times. Properly conditioned liquid cryogens can lead to set-it-and-forget-it consistent batch temperatures saving cryogen, saving time, and minimizing operator involvement.

The Controls – The ACCU-CHILL LXC controls are another important component of the whole system. Most products require a custom injection profile in order to deliver consistent and timely cooling. LXC's controls allow the injection scheme to be tuned for optimum performance. Using the included recipe functionality, each unique injection profile can be applied consistently to different product 'recipes' day in and day out.

Integration and Design – Perhaps the most important component of the ACCU-CHILL LXC system is the overall system design. During cooling, a high volume of liquid cryogen is needed at the mixer. Once the cooling cycle is complete, the flow of cryogen stops and does not resume until the next cooling cycle. Alternating between high-flow and no-flow several times per hour can be challenging. The entire LXC system must be well-designed to achieve the desired results at the mixer. Valve-nozzle quantity and placement is vital to a properly functioning system. Cooling cycle time, frequency, and volume all impact this important design detail. Piping system design is impacted by liquid cryogen conditioning, distance from the tank to the use point, batch cycle times and volumes, and piping style. Exhaust system design is impacted by all aspects of the system from valve-nozzle quantity to chilling volume and cycle time.

Benefits of the ACCU-CHILL LXC system

Linde's ACCU-CHILL LXC system can be installed in new or existing process equipment such as mixers, augers, blenders, and kettles. It requires minimal space and cools the product through direct contact of the food product and the cryogen. All the necessary components are custom engineered to fit your unique needs. The ACCU-CHILL LXC system is the latest and most advanced bottom injection design from the leaders in bottom injection knowledge.

- → Precise process control for consistent batch times and consistent product characteristics
- → Fewer hot and cold spots and batch-to-batch variations than with alternative technologies
- → Rapid temperature reduction of the product
- → Reduced risk of particle entrapment and cross-contamination
- → Fast and easy cleaning of the system for time and costs savings
- → Controlled final temperature with minimal variations throughout
- → Optimized quantity of nozzles required per blender or vessel
- → Low capital investment cost for the equipment
- → Improved productivity for downstream processes such as food-forming operations

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