

# Refrigerated air dryers safeguard against condensation

SMC Pneumatics recognises the importance of correctly prepared compressed air and strives to be the 'one supplier for all needs', going beyond pneumatics to provide solutions such as its range of quality air dryers to combat moisture.

In today's manufacturing environment, compressed air is an essential power source and therefore its quality requirements are vital. Even when meeting operational requirements, air moving through pipelines can lay down more moisture through condensation than is acceptable, causing costly damages to production machinery.

Brian Abbott, product manager at SMC Pneumatics says that a simple solution that is often overlooked is a quality refrigerated air dryer. "Water carried with compressed air to the production systems can cause significant damage to the valves, cylinders, fittings and more. Components tend to rust and lubrication is rinsed out, causing a significantly shorter life span and slower production," Abbott explains.

It is in fact, impossible to produce compressed air without depositing water into the system and as such, loss of income, replacement of parts, low levels of productivity and damage to the production system will prove more destructive than condensation itself to any business.

"Cost cutting around air preparation is never advised. As with most things, what you put in is what you get out and the solution is very simple. Dry air can easily be obtained by means of refrigerated air dryers, which are highly cost-effective in the long-run," says Abbott.

"Compressed air is led through the refrigerated air dryer, cooling it drastically to reduce the water content to between 10 and 3.0 °C at the pressure dew point. Dryers can be located on the most critical work stations in the production process, delivering air to the required ISO Class or they can be placed after the compressor for general usage," adds Abbott.

SMC's refrigerated air dryers chill the air to 3° C reducing the water content in the compressed air to around 6.0 g/cm<sup>3</sup>. The surplus water is drained directly from the refrigerated air dryer, and dumped via an auto drain.

Refrigerated air dryers are a cost-effective means of providing air with pressure dew points of 3.0 to 10 °C, thus meeting the requirements of ISO 8573-1 moisture classes 4 to 6. "All energy-efficient SMC refrigerated air dryers feature compact and quiet construction, stainless steel heat exchangers, Montreal Protocol-compliant refrigerants and low pressure drops," says Abbott.

"Models are available to meet various regional requirements in standard inlet temperature

designs as well as high inlet temperature models."

The IDU, IDF and IDH series from SMC are designed to each meet the unique requirements of factories using compressed air, offering various capacities to meet the demands of the modern customer. These energy-efficient solutions offer stable, compressed air temperature control while being able to withstand corrosion, regardless of external conditions.

The IDF refrigerated air dryer series uses refrigerants R134a and R407C to prevent any damage to the earth's ozone layer (medium size series use R22). The IDF series can accommodate an inlet temperature of 60 °C and corrosion resistance is improved by using a stainless steel, plate type heat exchanger.

Features include:

- Standard inlet temperature air.
- Stainless steel heat exchangers designed for long life and low pressure drops.
- Compact and quiet construction.
- Montreal Protocol compliant refrigerants.
- Energy efficient designs.

The refrigerated air dryer series, IDU, uses refrigerants R134a and R407C once again showcasing SMC's commitment to a greener environment (medium size series use R22). The IDU series provides a stable supply of dry air even under high demand conditions with an inlet air temperature of 80 °C.

Features include:

- Improved corrosion resistance with the use of stainless steel, plate type heat exchanger.
- Protects pneumatic equipment from moisture.
- Rated inlet air temperature of 80 °C.
- Refrigerant R134a (HFC).

SMC's IDH series of compact air dryers offers stable, compressed air temperature control with its integrated heater, regulator, dryer and filter. The IDH air dryer delivers a constant volume of compressed air at the correct temperature, dew point, pressure and cleanliness, regardless of external conditions or seasonal climatic conditions. Due to its compact size, and the ventilation holes on the front and top, the IDH can be installed close to a wall or panel.

Features include: and all-in-one air preparation with temperature and pressure control, drying and cleaning; and stable adjustable outlet temperatures of 15 to 30 °C, regulated to within 0.1 °C. □



**Above and below:** IDF series refrigerated air dryers from SMC can accommodate an inlet temperature of 60 °C and corrosion resistance is improved by using a stainless steel.



SMC's IDH air dryers are compact and offer stable, compressed air temperature control.

## Rapid sauce cooling technology now available in SA

A new, revolutionary technology that reduces sauce-chilling time from hours to minutes is now available in South Africa from Afrox. Developed by Linde, Afrox's parent company, the patent-pending ACCU-CHILL® SC in-line sauce cooling technology uses liquid nitrogen to rapidly chill pumpable hot liquid foods for the ready meals sauce market. This in-line process rapidly chills hot sauces within minutes instead of hours, increasing production capacity and improving product quality.

"Linde has been developing and trialling this new technology for some time and it is now ready for global roll-out. The ACCU-CHILL SC in-line sauce cooling technology is available in South Africa exclusively from Afrox," says Hendrik Pretorius – applications specialist at Afrox. Pretorius is part of Linde's specialist global team that develops new applications.

High viscosity sauces such as gravies, pasta sauces and soups need to be rapidly cooled down to minimise bacterial growth and maintain product quality. Traditional cooling methods rely on water immersion techniques or jacketed, tubular, scraped-surface heat exchangers.

The ACCU-CHILL SC in-line sauce cooling system is a streamlined, cost-effective alternative to traditional heat exchangers that are very costly, take up a large amount of space and have lengthy chilling times.

ACCU-CHILL uses cryogenic injector technology to inject extremely cold liquid nitrogen directly into hot, cooked sauce in a mixing container. The low temperature of the liquid nitrogen cools the sauce immediately without freezing it. The subsequent mixture of gas and sauce is transferred to a degassing vessel where the nitrogen is vented, before being pumped into packaging.

"In addition to reducing the cooling time – which reduces bacterial growth during processing – cooling technology eliminates the use of water in the cooling process and reduces sanitation time due to the elimination of heat exchangers," explains Pretorius. "Furthermore, cryogenic cooling eliminates the variation in cooling times with traditional methods, and thus prevents overcooking and improves nutritional value."

Pretorius adds that this new Linde sauce cooling system will complement future in-line cooking processes that are currently being developed.

The major components of the ACCU-CHILL® SC in-line sauce cooling system are a manifold, phase-separator and the chilling injector, which is connected to the hot sauce production line. Gaseous nitrogen is used to purge the lines and the injector after chilling to ensure that no product residue remains in the system.

The system can be tailor-designed by the global specialist team to suit customers' specific processing needs following an investigation of customers' existing processes, while a local team from Afrox will install the application and will provide support and training. □

The major components of Linde's ACCU-CHILL SC in-line sauce cooling system are a manifold, phase-separator and a chilling injector that is connected to the hot sauce production.



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