

CASE STUDY: Uin Foods

PROJECT: CO₂ Envifreezer & Spiral

UIN FOODS MAKES PUSH TO GO GREEN WITH STAR'S INDUSTRIAL CO₂ REFRIGERATION PACKAGE AND BESPOKE SPIRAL FREEZER

Star Refrigeration have been developing environmentally friendly freezing and refrigeration solutions for the UK's leading food manufacturers for nearly 50 years. When Uin Foods, a leading UK pizza manufacturer, decided to grow their business through an extension to their production facilities in Glasgow, they relied on Star Refrigeration's vast experience to design, build and install a turnkey solution to provide complete responsibility for their cooling needs.

Uin Foods is renowned in the industry for creating private label pizzas for the UK's retailers. With a management team with over 100 years of industry experience in food manufacturing, the company produces 25,000,000 pizzas each year. As a pizza manufacturer, the customer had very specific requirements, including a focus on energy efficient business and the use of a low carbon refrigeration solution. Star were able to fulfil these requirements with its vast range of products and decades of industry knowledge – and the bespoke equipment was delivered within 16 weeks.

Star Refrigeration offered a bespoke solution comprising an industrial CO₂ refrigeration packaged system and a spiral freezer. When combined, the Star's Envifreeze and the Helix spiral freezer

deliver a complete eco-friendly in line cooling solution at a competitive price.

John Whalen, Managing Director for Uin Foods said, "We are happy with the installation of our new freezer and refrigeration plant. By selecting a modern and energy-efficient refrigeration system which utilises CO₂ as a refrigerant, we are further committed to reducing the carbon footprint related to our manufacturing operations. Additionally, we have protected our business against the changes in legislation surrounding HFCs, saving us further time and investment in the future".



Uin Foods pre-engineered packaged system, which is designed to chill or freeze pizza bases with the flexibility to programme up to six different product sizes, provides 200kW of refrigeration capacity at -40°C. Up until now, those seeking refrigeration solutions in an industrial setting but with a capacity of under 300kW faced something of a conundrum as the F-Gas Regulation is moving end-users away from HFCs while, at the same time, the use of industrial ammonia systems is unsuitable in certain applications due to its capital costs and H&S requirements.

The Uin Foods project was managed from Star Refrigeration's head office in Glasgow. The company's contracting department has dedicated design, project management and site management teams to ensure that the project is managed on schedule and with the appropriate levels of legal compliance and health and safety. Star worked closely with Atom Consultants, one of the leading Food Factory Designer's in the UK offering Total Project Management, to achieve a well-coordinated installation programme to meet the client's project timeframe.

The refrigerant plant for the project included, the Envifreeze, a two-stage transcritical CO₂ system for lower temperatures which minimises refrigerant charge and removes the requirement for refrigerant pumps by incorporating Star pioneered low pressure receiver technology. The Helix Spiral Freezer was designed and installed by Starfrost, part of the Star Refrigeration group of companies. This combination has provided Uin Foods with an energy efficient solution that delivers greater flexibility within its processing line. The hot pizzas bases are frozen quickly and evenly without the need for precooling, enabling Uin Foods to increase operational hours and extend run times.

One of the most efficient features included in the

solution is the pre-set control system which adapts the freezing process for Uin's whole product range. The control system operates varying fan speed, air temperature and retention time specifically set to each pizza base specification. In addition, the 'Clean in Place' system provides optimised hygiene within Uin Foods production facility and reduces operational downtime for cleaning and maintenance.

The system also incorporates the following energy efficiency features:

EC condenser fans – the use of variable speed fans to increase efficiency and prolong operational life.

Air cooled condenser – using air cooled condensers instead of evaporative condensers to reduce operating costs by up to 20%

PLC control system – optimises operating efficiency at all times.

Heat recovery – isolation valves allows for water heating in the future if required.

CO₂ - the natural choice

Carbon dioxide is a naturally occurring substance which can be used as a refrigerant instead of manmade gases (HFCs) which are damaging to the environment. CO₂ has no effect on the Ozone layer, and has a global warming potential (GWP) of one – which is thousands of times lower than synthetic

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refrigerants. Global legislation is putting pressure on industrial users to reduce their environmental impact by replacing traditional high GWP refrigerants.

When it comes to natural refrigerants, many industrial applications use ammonia however there are disadvantages for smaller systems. Ammonia has high toxicity and the capital costs involved in developing an ammonia system are often not sustainable for end users with a lower output. Now, business with smaller industrial applications can take advantage of natural refrigerants thanks to the CO₂ Envi refrigeration packages.

Star Refrigeration has an unparalleled record of providing CO₂ systems to end users in a wide range of industries. With over 25 years of experience in the design, manufacture and installation of packaged systems and turnkey solutions which utilise natural refrigerants such as CO₂, Star have helped companies reduce costs and future-proof their refrigeration plants against government legislation surrounding HFCs. As the UK's largest independent industrial refrigeration contractor, Star works with some of the nation's biggest food manufacturers and distributors. Because Star is completely independent, it can offer a broader range of equipment based on quality, reliability and price.

David Wallace, Sales Director of Star Refrigeration said, "We are thrilled to be able to provide a bespoke turnkey solution for a well-respected manufacturer such as Uin Foods. Before we launched our industrial CO₂ refrigeration packages, there was no clear pathway for businesses which required a capacity of under 300KW but wanted to move to natural refrigerants. Thanks to our in-house design team and specialist technicians, we could deliver this refrigeration and freezing solution in just a couple of months, providing benefits to the customer for many years to come."

The Envifreeze is part of the Envi range developed by Star Refrigeration, which is the first refrigeration solution utilising CO₂ designed for industrial applications.

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