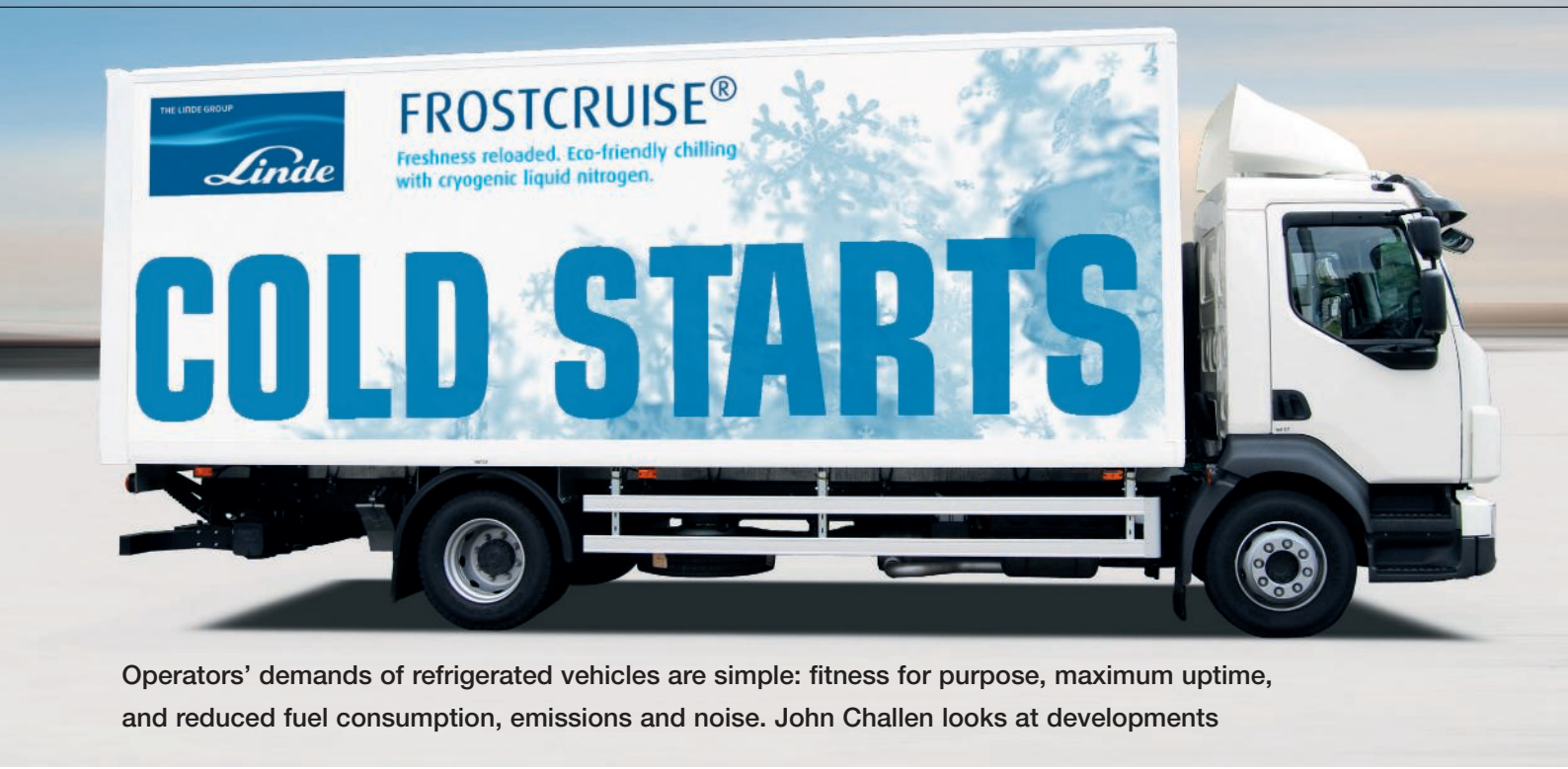


Operators' demands of refrigerated vehicles are simple: fitness for purpose, maximum uptime, and reduced fuel consumption, emissions and noise. John Challen looks at developments

As demand for refrigerated vehicles grows, temperature control technologies continue to see developments aimed at improving efficiency, reducing downtime and cutting the cost of transporting temperature-dependent loads. That's particularly the case with onboard equipment for LCVs, with uptake driven by the supermarket and home delivery fleets.

Home delivery of groceries now accounts for some 5% of the big supermarkets' business, but refrigerated vehicle conversion specialist Paneltex reckons that could peak at 20% in the next 10–15 years. Greater demand means more vehicles and that fuels competition – which drives technology.

So, what's happening? Chris Berridge, managing director of Paneltex (which has so far supplied 1,000 vehicles to the likes of Tesco, Asda and Sainsbury's), says the highest priority remains payload. Vehicle weights, he reminds us, have been rising, primarily due to the addition of extra safety and comfort systems. Euro 6 has also resulted in weight penalties for trucks – due to the extra componentry involved with EGR (exhaust gas recirculation) and SCR (selective catalytic reduction) systems – and vans in the 1,760–3,500kg gvw range will follow, come 2016.

Smarter thinking

"So we're getting smarter, using alternative materials and looking at every single component, aiming to optimise design and reduce weight," states Berridge, adding that lighter materials are key. "By saving a kilo here and there, you soon cut 10kg, which makes a big difference."

This matters, and particularly for chassis cabs. "Years ago, you could get more payload – but less volume – with a converted panel van than a box body, because the panel van was lighter," he continues. "But van weights have increased and there's not much we can take out. With a chassis cab, we've got a lot more scope to customise it and drive the weight of the body down."

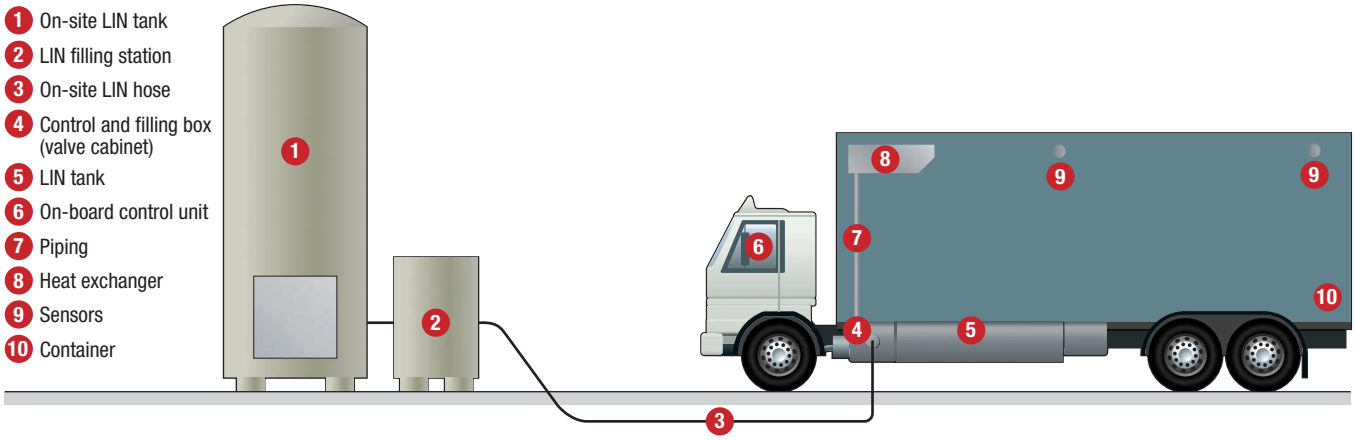
But as well as vehicle refinements, refrigeration companies are also working on technology. Carrier Transicold, for example, recently added the mono-temperature, reduced capacity Vector 1350 trailer unit to its larger 1550 and 1950 models, with a refrigeration capacity of 12.7kW and advantages in terms of fuel consumption, weight saving and noise.

The company also offers mono- and multi-temperature refrigeration units for panel and box vans, in the form of its Neos, Vento, Pulsor and Xarios ranges, but the Vector 1350 is interesting because of its lighter weight and electrical drive. "We recognise that operators are concerned with whole life costs," says Carrier Transicold managing director Justin Grace. "This means they take into consideration not just fuel and maintenance, but factors such as payload. If you shave 150kg off the refrigeration unit, that makes a big difference over the life of a trailer."

The first Vector 1350s are entering service now, and Grace says they are the lightest of their type. "If operators want a lower cost unit, which consumes less fuel, and they only need one temperature in the compartment, the 1350 is ideal," he says. "We also know operators are looking for reliability and we've tried to help here by taking out as many components as possible to reduce the potential for breakdown."

Grace says that Carrier is looking

Carrier Transicold's Vector 1350 is claimed to shave 150kg off many conventional alternatives



Frostcruise: a greener approach to onboard truck refrigeration

to adopt a similar approach for its larger refrigeration models, but it is far from straightforward on bigger trailers. "The problem is that refrigerants are extracting heat from a place where it is not wanted, but the power and capacity have to come from somewhere," he reasons. "We are looking for solutions, but nothing is likely in the next 12 months."

Except, that is, for an entirely different approach. Whereas the vast majority of refrigeration units (including Carrier Transicold's) are mechanically-driven – either electrical or via a diesel engine driving a compressor in the standard vapour compression cycle – there are now other options. Linde and UK subsidiary BOC, for example, have developed what they describe as an 'eco-friendly solution for the transportation of perishable chilled and frozen food'.

Dubbed Frostcruise, it uses liquid nitrogen, stored in a chassis-mounted insulated tank at -196°C, which is piped through a heat exchanger having an unusually large surface area. That causes evaporation and fans circulate cold air around the compartment. Thermal efficiency is claimed to be 97% and, because it isn't reliant on the truck engine running to maintain temperature, the vehicle load remains chilled even when the engine is switched off.

Operators using Frostcruise can expect to see compartment temperatures reduce from 16°C to just 2°C in eight minutes, according to BOC – less than half the time possible using mechanical refrigeration equivalents. They will also, unlike many diesel-operated refrigeration units, be able to operate vehicles fitted with the new technology between 10pm and 6am, due to its low noise emissions. Typical liquid nitrogen consumption is 30—50 litres/hour, depending on conditions, and the firm estimates that typical fuel consumption improvements are 1–3 mpg, compared with conventional diesel systems. It also claims double the equipment lifetime and suggests a carbon footprint improvement of 15% in summer and 12% in winter.

These latter points were seen as key to Marks & Spencer and Starbucks, which added two and five Frostcruise vehicles respectively to their fleets late last year. Both companies commented on the system's positive environmental impact and, subsequently, their operations. "Trialling innovative technologies, such as Frostcruise, is an important part of our [eco and ethical programme] Plan A," comments Anthony Whitehouse, logistics manager at Marks & Spencer. "We've achieved a great deal in reducing emissions and road miles, but we can and will do more. Projects like this help us find ways and partners to help us achieve this and tackle some of the biggest challenges we face." TE

Refrigeration rentals: choice approach

One transport firm taking advantage of the upturn in demand for refrigerated vehicles is Premier Truck Hire. When, late last year, the Blaydon-based vehicle rental company was looking to buy refrigerated trucks, it selected 7.5-tonne DAF LF-based chassis mounted with Gray & Adams single-compartment bodies having triple rear doors and single side doors.

This was a £500,000 investment for Premier Truck Hire, so getting the right specification was critical, says business development manager Allun Cairns. "I have long experience of working with Gray & Adams, and its insulated bodies are widely recognised as the best on the market in terms of build quality and durability," comments Cairns, adding that its ability to build bespoke box vans was also key.

As for refrigeration units, Premier Truck Hire went for Carrier Transicold's Xarios 600, chosen for its ability to support "full flexibility between chilled and frozen foods".