

Cool solutions

The demand for increased productivity hasn't only been visited on truck manufacturers. Trailer makers are being stretched and nowhere more keenly than in cool chain distribution. Ian Norwell reports



Tractor manufacturers that have been put through fuel economy trials may well have prayed for decent trailers to hitch to their über tractors. It's a level playing field, of course, but they are well aware of the impact shabby trailers can have on fuel economy. Refrigerated trailers have extra points to prove, such as chill-down times, running costs and efficiency of the chiller units themselves. And, because they are usually operated by the most public-facing of fleets, there are also green credentials at stake.

Two of the UK's leading manufacturers in this sector – Schmitz Cargobull and Carrier Transicold (with Gray & Adams and Solomon) – have useful developments, while a third innovator has a clever, if slightly left field, solution.

Schmitz has been a big player in the European fridge trailer market for years, with a dedicated plant in Vreden, Germany. But now the firm is making a move that should raise eyebrows at other trailer fridge unit makers and possibly make a few fleet engineers pause before re-ordering. Schmitz's decision to manufacture its own chillers will certainly put the firm in a powerful position – and note that the new units will only be available on its own trailers.

With no plans yet for rigids, the most noteworthy characteristic of Schmitz's chillers will be stepless speed control, giving temperature regulation (not just high or low) over the entire trailer length. However, Markus Dechering, product manager at Schmitz, says the main point is that providing the whole package should give operators confidence, not only with the hardware, but with back-up, too.

"We can now offer the combination of a reefer trailer, cooling unit and the controlling telematics from a single manufacturer. It gives us the opportunity to provide what we call our proactive service," he explains. That service will monitor its chillers 24/7 and automatically call up support, if needed. Dechering

also claims an advanced evaporator design, with fewer defrost cycles, and a generator-driven system offering improved capacity, making these fridge units faster, too. At present, it's only a mono-temperature affair, although multi-zone models are due in the summer. It's also based on a 13.4-metre trailer, so there remain a couple of gaps to fill. However, this move could give fleet operators one less phone number to worry about.

Meanwhile, for those concerned about maximising cool payloads and cubes, Gray & Adams' 15.65-metre reefer LSTs (longer semi-trailers), developed for Morrisons, are interesting. The retailer began taking delivery of its 100-strong fleet last summer and, according to Morrisons' head of engineering John Ward, the 15% increase in productivity (four extra pallets, bringing the total to 30) translates into "tremendous" cost savings.

Flexible friend

Just as important, Ward points to Morrisons' choice of multi-temperature refrigeration – Carrier Transicold Vector 1950s with dual-discharge slim line evaporators – instead of its usual single-temperature specification with fans. "We've purchased these latest trailers for operation in the south of the country, where there is more traffic congestion, and where loads are likely to be on the vehicles for longer," he explains. "The switch to multi-temperature refrigeration allows us to guarantee the integrity of three separate regimes in these circumstances."

But it's not just about LSTs. As livestock hauliers discovered some time ago, the flexibility of a drawbar can make vehicle access a lot easier and lift productivity. Tesco's Express stores are typically in built-up areas, so the firm recently took its first 18.75-metre temperature-controlled wagon-and-drag. A Wheelbase Engineering design with Solomon bodywork, it's fitted with Carrier Transicold's Supra

Schmitz Cargobull's new refrigeration unit, designed for its own reefers



This trailer uses natural refrigerant. How cool is that?

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850 MT refrigeration unit on the rigid, and a Supra 1150UMT (multi-temperature) under-mount unit on the trailer. The verdict so far: Tesco gets a double benefit, with improved access and three additional roll cages over its standard 13.6-metre semi-trailers.

That said, there's more to cutting emissions than improving temperature-controlled vehicle productivity. Greenhouse gas emissions are another potent issue, with in-service leakage of conventional HFC (hydrofluorocarbon) refrigerants – such as R-404A, used by the vast majority of chillers in circulation – bad news to environmentalists. That's where Carrier Transicold's new Naturaline chiller, which uses benign CO₂ as the refrigerant, comes into its own. Justin Grace, managing director for northern Europe at Carrier Transicold, explains that CO₂ has a GWP (global warming potential) of one, which compares very well to R-404A, which has a GWP of 3,920.

Doubtless, EU legislation will come. In the meantime, however, Sainsbury's – which has a

4,000-strong fleet, much of it temperature controlled – has set out to reduce its carbon emissions by 30% absolute, and 65% relative by 2020, compared with 2005. As part of that, a trial Naturaline vehicle (above) has been with the retailer since October 2013, operating from its Elstree depot, delivering frozen goods to stores across Greater London.

"Now we have proof on concept, we will move ahead with a full road transport version," comments Grace. "It was based on the unit used in our deep sea container operation," he adds.

The only inconvenient truth developers need to deal with is the energy required to liquefy CO₂ gas. If it's driven by wrong-time or off-peak energy, there's a well-to-wheel query. On the other hand, if it harnesses renewables, it could just close a virtuous circle. 



Nick Owen, chief technology officer, Dearman

Just so much cold air?

Not content with running a more environmentally acceptable chiller unit without HFC refrigerant, as efficiently as possible on diesel, one UK innovator is preparing to run on liquid air. That company is Dearman, which is developing its novel system with £20 million backing through the government's Innovate UK (formerly the Technology Strategy Board).

The Dearman liquid air engine, named after its inventor, relies on the fact that liquid (cryogenic) air expands 710 times in volume and drops temperature dramatically when it returns to gaseous state at NTP (normal temperature and pressure). Using a heat exchange fluid to speed that expansion provides enough energy to drive reciprocating engines for chillers or even motive power. Dearman chief technology officer Nick Owen is overseeing trials at MIRA, with the support of Air Products, one

of Britain's biggest industrial gas suppliers.

The simplicity and elegance of this engine remind me of the hydrogen fuel cell, with water vapour the only emission. That trudged interminably through scepticism and naysayers to eventually reach a working device. However, the challenge still remains to bring the fuel cell to market at an acceptable price. The liquid air engine is a few laps behind but, with cold air the only exhaust, let's hope it has the energy to tread the path to technical validity.

