

V-Force™ Performance is Fan-tastic!

Since its introduction three years ago as an enhancement to the X2™ series, the V-Force™ fan has become integral to Carrier's full line of trailer units.

Designed with vortex-suppression tips that virtually eliminate spinning pockets



of recirculating air, it reduces fan noise and boosts efficiency, compared to traditional fans. At half the weight of the fan it replaced, it helps reduce stress on drive

components, all while delivering 8 percent more airflow to the radiator and condenser than a conventional fan.

Also now featured on Vector™ units and coupled with other sound-attenuating features, such as doors designed for acoustic abatement, V-Force fans make Carrier units exceptionally quiet compared to trailer units of just a few years ago.

Innovation ON! At 2011 IFDA Event

In distribution, improving your game never ends, according to the International Food Service Distributor's Association, hence "Innovation ON," the theme of its [2011 Distribution Solutions Conference](#), Oct. 24 – 26 in Fort Worth, Texas.

Of course, innovation is always on with Carrier Transicold. If you're at the event, we hope you'll visit us at booth 809, where you'll see our innovative Vector™ 6600MT multi-temp hybrid units, and the all-electric Vector 5100 for stationary storage applications.

We look forward to seeing you there!

Dealer Locator

e "Now Hear This!" Test Shows Vector™ Always a "Sound" Choice

We're making a little noise this month about the results of some recent testing by Carrier that showed hybrid Vector™ units to be North America's quietest diesel-powered trailer refrigeration systems.

In fact they're so quiet that even when running in high-speed cooling mode they measure six decibels quieter than a competitive unit equipped with a factory-installed sound reduction package. Acoustically speaking, that amounts to a 4:1 difference in sound. In other words, it would take four Vector 6500 units running in high-speed cooling mode to equal the sound level of the competitive unit tested.

Less noise improves conditions for drivers in sleeper cabs, and also helps as refrigerated trailers operate near residential areas whether they are just passing through or if congregating at distribution centers or supermarkets.

[Learn more about the test.](#)



TRU-torial: Tips for Saving Fuel in LTL Refrigerated Ops.

Whether you're the kind of person who sees a less-than-truckload (LTL) situation as a trailer half full or half empty, you can still be both an optimist and a pragmatist when it comes to fuel savings.

With diesel fuel prices hovering around \$4 per gallon, nimble fleets are looking for tips and tricks to economize. "Although there is no one size fits all solution, sometimes changing the interior size is the solution," notes Kevin Williams, Carrier Transicold trailer product manager, who explains the formula for virtually downsizing the trailer of your transport refrigeration unit (TRU) to cut fuel expenditures in [this issue's TRU-torial](#).



$$TRU \text{ heat load} = (100^{\circ}F - 0^{\circ}F) \times 150 = 15,000 \text{ BTU}$$

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“Now Hear This!”

Test Shows Vector™ Units Always a "Sound" Choice

There are plenty of sound reasons for considering Vector™ trailer refrigeration units from Carrier Transicold, and now sound itself — or rather its lack of noise — is another. Designed for efficiency and low maintenance, hybrid Vector units are also North America's quietest diesel-powered trailer refrigeration units.

In recent testing by Carrier Transicold, the Vector™ 6500 single-temperature unit was paired against a competitive unit of comparable capacity equipped with a factory installed sound-reduction package.

All testing was done by Carrier Transicold in accordance with ARI 1120, the Air-Conditioning and Refrigeration Institute's 2007 Standard for Acoustical Test Methods and Sound Power Rating Procedures for Transport Refrigeration Equipment.

The outcome: When running in high-speed cooling mode, the Vector unit's sound output measured at least six decibels quieter than the competitor.

“Putting this into perspective, it would take four Vector units running in high-speed cooling mode to produce the sound volume of a single conventional competitive unit equipped with a noise abatement package,” said Dave Kiefer, Carrier Transicold's director of marketing and product management.

“In the high-speed heating test, the Vector unit was even more impressive,” Kiefer said, explaining that unlike conventional units, Vector units heat with electric resistance strips, which do not require use of the compressor. In the high-speed heat



mode, the Vector unit measured 10 decibels quieter than the competitor, with a sound output that is low enough to be comparable to the decibel range of normal conversation.

Contributing to the Vector unit's low sound output is its all-electric refrigeration system that, unlike conventional systems, doesn't have the numerous mechanical components that contribute to engine and compressor noise. Vector units also take advantage of noise-reducing V-Force™ condenser fans with vortex-suppression technology. With doors designed for



acoustic abatement, both the Vector 6500 and its multi-temperature sibling, the Vector 6600MT, include a bottom panel that helps further contain engine sound.

Turning up the Quiet

“Hauling operations seeking the quietest choice in high-capacity trailer refrigeration systems should consider Vector units,” Kiefer said. “Although conventional trailer refrigeration systems, including Carrier's X2™ series, have been designed over the years to perform more quietly, the issue of noise is more relevant than ever.”

Less noise improves conditions for drivers in sleeper cabs, and also helps as refrigerated trailers travel through residential neighborhoods going to and from supermarkets, in neighborhoods adjacent to refrigerated distribution centers, or where multiple refrigerated trailers congregate.

“When parked during loading and unloading, Vector units can be plugged into an outlet and powered electrically, enabling them to deliver full-capacity cooling without using the diesel engine. This ‘standby operation’ drops the sound output by another three decibels in cooling mode. In heating mode, when the compressor operation is not required, the unit is virtually silent,” Kiefer said.

More than just reducing sound, Vector units in standby operation eliminate engine emissions from the refrigeration unit, conserving fuel, and reducing operating costs by 40 to 70 percent, depending on the price of fuel and electricity.

For more information about Vector 6500 and Vector 6600MT hybrid units, or the engineless standby-only Vector 5100 all-electric refrigeration unit, turn to the experts within the Carrier Transicold dealer network or visit www.trucktrailer.carrier.com.



TRU-torial: Tips for Fuel Saving with LTL Refrigerated Hauling

Whether you're the kind of person who sees a less-than-truckload (LTL) situation as a trailer half full or half empty, you can still be both an optimist and a pragmatist when it comes to fuel savings.

With diesel fuel prices hovering around \$4 per gallon, nearly \$1 more than this same time last year, nimble fleets are looking for tips and tricks to economize. "Although there is no one size fits all solution, sometimes changing the interior size is the solution," said Kevin Williams, Carrier Transicold Trailer product manager.

"In many situations, refrigerated haulers start with a full load, and the load gradually decreases as they make deliveries along the route," Williams said. "As the refrigerated content of the trailer empties, is it still essential to cool the entire space? In many instances, the answer is 'no.' If only you could reduce the size of the trailer, that smaller interior would require less refrigeration, which would definitely save some fuel. When business models allow, some companies do essentially that by using movable bulkheads."



With a movable bulkhead, a hauler can essentially make the trailer smaller, and therefore reduce the volume of space to be refrigerated. Pragmatic examples where a bulkhead can help:

- If hauling LTL, a bulkhead can make a space within the trailer just large enough for the refrigerated contents, so the TRU will have to run less.
- When making multiple stops and unloading at each stop, if refrigerated goods are removed from the rear of the trailer, the bulkhead can be repositioned toward the front to continually make the interior "shorter" as the load diminishes.
- Situations in which dry goods are also carried and could actually add heat to the trailer can be avoided by placing a bulkhead as a barrier between chilled and dry cargo.



Carrier's Universal Portable Bulkhead fits varying heights and widths, is lightweight and can be installed, and moved, in minutes. A non-permanent solution, it can be removed for use in other trailers.

Size Matters

There are many things that add to the cooling, and hence fuel consumption, required by a Transport Refrigeration Unit (TRU). One of them is the sheer volume of the space inside the trailer. Normal heat transfer through the trailer walls is another. "This measure of the trailer size and how well it is insulated is known as the UA value," said Williams.

The lower the UA, the better, because the amount of heat the unit needs to remove equals the UA value multiplied by the difference between the outside and inside temperatures.

"Just to keep the math simple, let's assume it's 100°F outside and your setpoint for the product inside is 0°F," Williams said. "If the trailer's UA is 150, then the amount of cooling required by the TRU

is 15,000 BTUs. That's 100°F minus 0°F (or 100), times the UA of 150. If a TRU running at maximum capacity of 30,000 BTU at a setpoint of 0°F in this example consumes approximately one gallon of fuel per hour, then you'll need 0.5 gallons per hour just to maintain 0°F inside that trailer."

"Now what if the trailer was never completely full, or some cargo has already been removed? If a bulkhead is placed just three pallet positions from the back door, it effectively shortens the trailer to only 40 feet long. That lowers the UA of that smaller area to approximately 120," Williams said. "Now instead of 15,000 BTU to cool the entire trailer, the demand on the unit would be reduced to 12,000 BTU, or approximately 0.4 gallons per hour to cool, a 20 percent savings. Multiply that hourly savings times the amount of time the equipment is on the road, and then multiply it against the size of your fleet, and the savings can potentially be considerable."

Keep Dry Goods Separate

A common practice, especially on distribution trailers, is to place dry goods in the chilled compartment. While this offers certain conveniences, some operations may want to consider separating the dry goods into their own compartment, if practical.

Dry goods generally don't need to be temperature controlled and likely are at ambient temperature when loaded, so in these situations the refrigeration unit works needlessly to cool down the dry product to the temperature of chilled contents.

"It can take a lot of cooling to unnecessarily lower the temperature of the dry goods, plus the heat given off by the dry goods can potentially damage the perishable products," said Williams.



A common practice is to place dry goods in the chilled compartment. Dry goods should be kept separate, as shown.

As an example, 5,000 pounds of dry goods at 80°F placed inside a 35°F chilled compartment would require approximately 125,000 BTUs of cooling from the TRU. "125,000 BTU of cooling can equate to roughly two gallons of diesel, so doing that every day across your entire fleet can add up," Williams said.

Placing a bulkhead in the trailer to isolate the dry goods not only saves the TRU from trying to cool them, but it makes the chilled compartment smaller, leading to less TRU run time, which lowers maintenance costs and extends warranties in addition to fuel savings.

"While these suggestions may not apply to every situation, occasionally you need to look at the details of your operation and look for continual efficiency improvements," Williams said. "Little things can add up to big savings that can benefit your bottom line as well as the environment."



Universal Rear Vinyl Curtains from Carrier are intended to help keep cold air from escaping a trailer when the rear doors are open and can be repositioned within the trailer to reduce the refrigerated interior space or to partition dry compartments.