



United Technologies

NaturaLINE™



*In making history,
we've created the future.*



NaturaLINE™

Natural Leadership

Carrier has been a pioneer in sustainability from the very beginning. We were among the first companies to launch factory energy reduction goals and we led a worldwide chlorofluorocarbon (CFC) phase-out years before the deadline set by international laws and regulations for developing countries. We have always designed with the environment in mind, innovating new products and technologies that avoid waste and preserve resources for future generations.

Now, building on our legacy of sustainability, we've created the future of container refrigeration. Naturally.

The first natural-refrigerant based solution ever developed for marine container shipping, the NaturaLINE™ unit delivers an environmentally sound alternative for refrigerated marine transport. Just as our PrimeLINE® unit raised the bar for energy efficiency, the NaturaLINE unit sets a new standard for sustainability. By using carbon dioxide (CO₂) as a natural refrigerant, the NaturaLINE design improves upon the PrimeLINE unit's ability to reduce carbon emissions by 28 percent compared to previous units, while matching its best-in-class energy efficiency.

The Natural One

For container shipping, CO₂ is the only refrigerant that meets all of the following criteria:

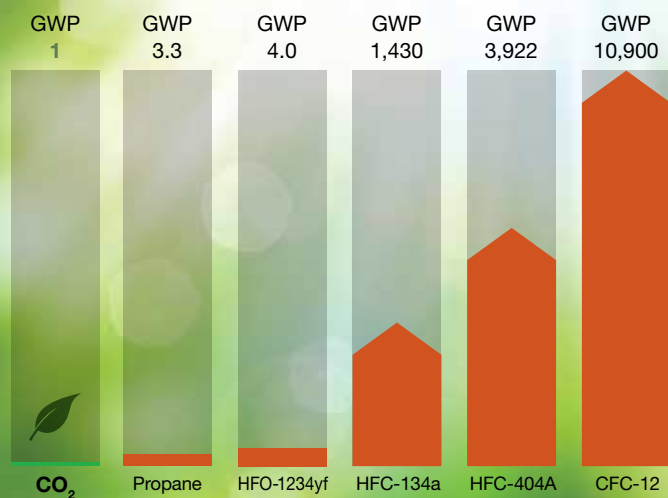
- Global warming potential (GWP) of 1
- Zero ozone depletion potential (ODP)
- Excellent heat transfer/heat reclaim properties
- Non-flammable
- Cost-effective, available worldwide and requires no special disposal

Why CO₂?

While carbon dioxide offers a multitude of benefits, ONE stands out. CO₂ has a global warming potential (GWP) of 1. That is 1,400 times less than the GWP of the closest synthetic refrigerant currently used in today's refrigerated container systems – essentially making it the baseline against which all other refrigerants are measured.

Carrier avoids adding risk to the environment by using naturally-occurring and non-ozone-depleting CO₂ recycled from the atmosphere.

Refrigerants-Environmental Impact



Source: IPCC SAR WG 1, 2010

GWP = Heat trapped per kg of greenhouse gas
Heat trapped per kg of CO₂



Introducing NaturalLINE™

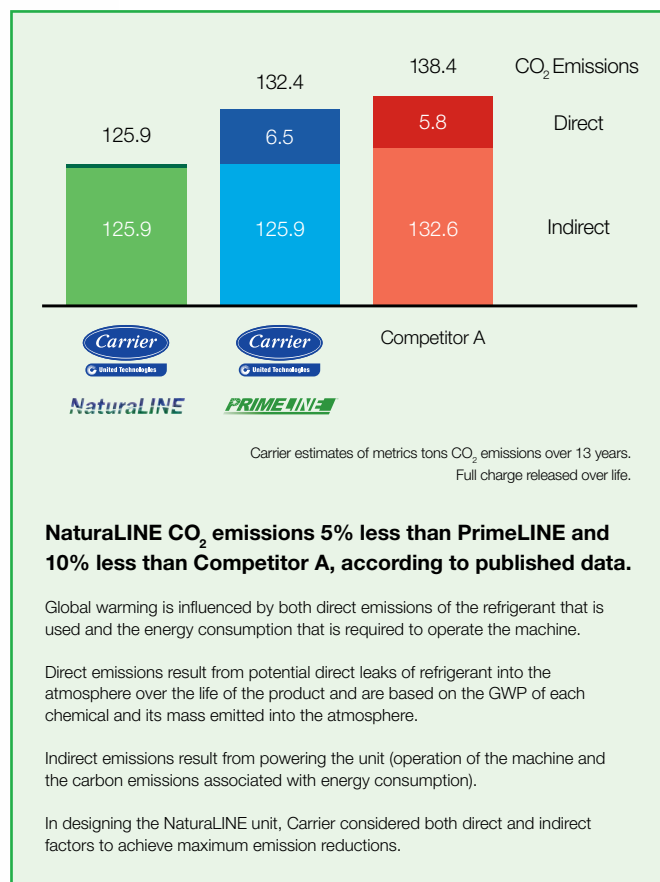
The world's first natural refrigerant technology for container refrigeration.

The first technology of its kind, the NaturalLINE unit incorporates CO₂ in place of conventional synthetic refrigerants to deliver best-in-class sustainability and efficiency.

It's the future of container refrigeration – delivered by the Natural Leaders at Carrier.

natural

CO₂ Equivalent Emission Comparison



We've revolutionized the transport refrigeration industry again. Naturally.

With ongoing concerns about sustainability and the environment, NaturaLINE is the clear choice for the shipping industry.

The introduction of natural refrigerant technology comes at an optimal time, with shipping lines under increasing pressure to reduce their carbon footprint. The use of synthetic refrigerants in certain applications continues to draw the focus of governments and the environmental community because of their higher GWP.

Well ahead of any potential regulations, NaturaLINE technology responds to customer concerns about GWP. It's just one more example of Carrier's ongoing commitment to developing new technology that minimizes environmental impact while serving customer needs. And that's what natural leadership is all about.

Multi-Stage Compressor

Gas Cooler Coil

Two-Speed Gas Cooler Fan

Flash Tank

Variable-Speed Drive

Advanced Software

The NaturaLINE unit uses recycled CO₂ as a natural refrigerant, lowering environmental impact for marine shipping.

The NaturaLINE unit has been validated as 95 percent recyclable by UL Environment, according to the environmental claim validation procedure 2789.

UL
VALIDATED
NATURALINE TRANSPORT REFRIGERATION EQUIPMENT HAS AN EXPECTED RECYCLABILITY RATE OF 95%, PER UL ECVF 2789



Innovative. Yet familiar.

The NaturalLINE unit includes a number of patented “firsts” for container refrigeration applications. Yet the NaturalLINE unit is as easy and familiar to operate and service as our industry-standard ThinLINE® unit.

NaturalLINE means new technology:

Multi-Stage Compressor

NaturalLINE's design makes use of an exclusive, new multi-stage compressor that maximizes capacity while minimizing power consumption.

Variable-Speed Drive

A custom-designed variable-speed drive electronically adjusts compressor speed to provide the precise amount of cooling capacity when needed.

Gas Cooler Coil

Compact and lightweight by design, the gas cooler coil wraps around the fan to maximize heat-transfer surface area for greater efficiency.

Flash Tank

For efficient cooling performance, the flash tank manages the flow and phase change of the refrigerant after leaving the gas cooler.

Two-Speed Fans

The NaturalLINE unit's evaporator and gas cooler use two-speed fans, offering greater versatility and energy-saving performance.

Advanced Operating Software

The NaturalLINE unit's operating software has been reengineered to manage its unique mechanical system, providing the same easy-to-use Micro-Link™ control interface found throughout our container lineup.

Zero-GWP Foam

The polyurethane foam blowing agent technology used in the NaturalLINE unit has high insulation properties without contributing to GWP.

Featuring:

- Power consumption comparable to Carrier's best-in-class performer
- Best-in-class carbon footprint
- No CO₂ refrigerant tax
- No intermediate refrigerant step
- Familiar controls and maintenance
- Zero-GWP foam
- Global support from Carrier



PERFORMANCE SPECIFICATIONS

NaturaLINE™



Cooling Capacity: Ambient @ 38°C (100°F) and 60 Hz power with Purpose built R744 Compressor

Temperature	Watts	Btu/hr
2°C (35°F)	9,400	32,000
18°C (0°F)	6,000	20,500
-29°C (-20°F)	4,400	15,000

Specifications are subject to change without notice.

Standard Features:

Refrigeration System

- 1 GWP/Zero ODP R744 (CO₂) refrigerant
- High-efficiency evaporator and gas cooler coils
- Electrostatically coated all-copper gas cooler coil
- High-efficiency vane-axial evaporator fans
- Three-phase dual-speed evaporator & gas cooler fan motors
- Electronic expansion valve
- Flash tank economizer with flow separator, Al coated for superior corrosion protection
- ATO (Sprengrer)-accepted adjustable fresh-air exchange

Electrical System

- Wired for 380/460 volt 3ph 50/60 Hz power
- Safe, 24-volt AC control circuit with fuse protection
- 18m (60 ft) power cable with attached CEE-17 plug
- Variable frequency drive
- Electric heat
- Main power circuit breaker

Control System

- Micro-Link® 3 modular controller with dual sensors
- DataCorder™ electronic data recorder
- Dual backlit LCD display
- Evaporator motor logic
- Pressure-limiting feature
- Cool, Heat, Defrost, In-Range, Alarm indicator lights
- Selectable timed electric defrost (3-/6-/9-/12-/24-hour settings) or automatic defrost
- Manual defrost initiation
- Current-limiting feature
- Interrogator plug
- Suction and discharge temperature sensors
- Suction and discharge pressure transducers

Convenience Features

- Removable front service panels
- Forklift pockets
- TIR compliant

Accessories and Options

- USDA cold-treatment recording package
- Rechargeable power-up battery pack
- Electronic power line communication module (RMU)
- Remote monitoring receptacle (ISO 4-wire)
- Dehumidification control
- Fresh-air vent position sensor
- eAutoFresh™ on-demand ventilation
- Hinged rear bulkhead panel with quick-release fasteners
- Thermometer insertion ports (supply/return air)
- LED display
- Convenience handles
 - Center
 - Left and right
- Rain gutters (bolted or riveted)
- Interrogator plug location inside control box
- Nitrogen insertion port
- Transfresh module
- Secure rechargeable battery
- Certification: ABS, BV, KRS, GL
- CE marking

The Americas

Carrier Transicold
Container Products Group
1095 Cranbury S. River Road
Suite 23
Jamesburg, NJ 08831 USA
Tel: +1-609-655-7605
Fax: +1-609-655-3595

Europe/Middle East/Africa

Carrier Transicold Limited
Pittsburghstraat 21
3047 BL Rotterdam
The Netherlands
Tel: +31-10-2380100
Fax: +31-10-2380142

Asia/Pacific

Carrier Transicold Pte. Ltd.
251 Jalan Ahmad Ibrahim
Singapore 629146
Tel: +65-6213-6388
Fax: +65-6862-5309

Asia/Pacific

Carrier Transicold
Container Products Ltd.
Unit 01, 16/F
Global Gateway (HK)
168 Yeung Uk Road
Tsuen Wan, N.T.
Hong Kong
Tel: +852-288-00389
Fax: +852-288-00314

Japan

Carrier Transicold
Container Products Ltd.
Residia Tower
Roppongi 12016-18
Roppongi 7-chome
Minato-ku Tokyo 106-0032
Japan
Tel: +81-3-5772-3668
Fax: +81-3-5772-3669

Australia

Carrier Transicold
Australia Ltd.
5 Hill Road
Wentworth Point
NSW 2127
Sydney, Australia
Tel: +61-2-9648-6100
Fax: +61-2-9648-6101

Carrier Transicold
Container Products Group
P.O. Box 4805
Syracuse, NY 13221 USA

www.carrier.com/naturaline



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