



It's Hard To Stop A Trane.®

THE TECHNOLOGY STORY

62-7400-01

THE UNSTOPPABLE STORY



DESIGN

TESTING

INNOVATION

TRANE
TECHNOLOGIES™

LEADING THE INDUSTRY

Trane is the obvious choice for top dealers and discriminating homeowners who value our commitment to purposeful design, rigorous testing, and industry-leading innovation.

Reliability and Innovation that Never Stop

1913

James Trane and his son, Reuben, found the Trane Company.

1964

The Spine Fin™ coil debuts, revolutionizing Trane's heat-exchanging capabilities.

1984

The innovative System Extreme Environmental Test lab opens in Tyler, TX.

1925

Trane invents the convactor radiator, a lightweight, efficient replacement for the heavy cast iron radiators of the time.

1971

Trane equips the Apollo 15 Lunar Rover for its first mission with a specialized brazed aluminum heat exchanger.

PLAN FOR PERFORMANCE

Performance and reliability begin with great design. First, we design our units to work in the most difficult conditions, then we load them with features that will delight homeowners and dealers alike. But we don't stop there; we've designed our manufacturing processes to ensure that what comes off the end of the line is exactly what you'd expect from Trane.

PROVE OUR METAL

Great design means nothing without superior performance. Homeowners and dealers trust us to provide the most reliable equipment possible, and we take that responsibility seriously. We subject our equipment to a gauntlet of punishing tests at every stage to make sure it performs in even the most extreme conditions.

KEEP PUSHING BOUNDARIES

With over one hundred years of innovation under our belts, you might think we'd take it easy. But we don't rest on our laurels — we continue to push for more. From next-generation technology like remote diagnostics and real-time jobsite assistance, to indoor air quality and improvements in sustainability, we never stop, and we never settle.

Sometimes, Perception Matches Reality

Our brand reputation precedes us — we have been named America's Most Trusted® HVAC Brand every year since 2015 as well as the Most Reliable Brand — precisely because our reliability is legendary.



AMERICA'S MOST TRUSTED® HVAC BRAND 9 CONSECUTIVE YEARS¹



MOST RELIABLE HEATING AND COOLING EQUIPMENT BRAND²

2006

Trane CleanEffects® reinvents whole-home air purification.

2022

Trane Link is released, simplifying installation, commissioning, monitoring, and servicing of variable speed systems.

1989

Trane launches the first ever Variable Speed hermetic compressor.

2014

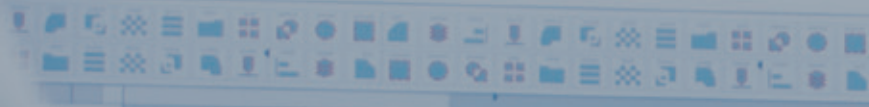
Nexia Home and Diagnostics launches, enabling remote system control and monitoring (now Trane Home and Diagnostics).

¹Disclaimer: Trane received the highest numerical score in the proprietary Lifestory Research America's Most Trusted® HVAC Brand study for years 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022 & 2023. Study results are based on experiences and perceptions of people surveyed. Your experiences may vary. Visit www.lifestoryresearch.com

²Trane Technologies Marketing Insights. Trane Brand Consumer Survey, September 2023.

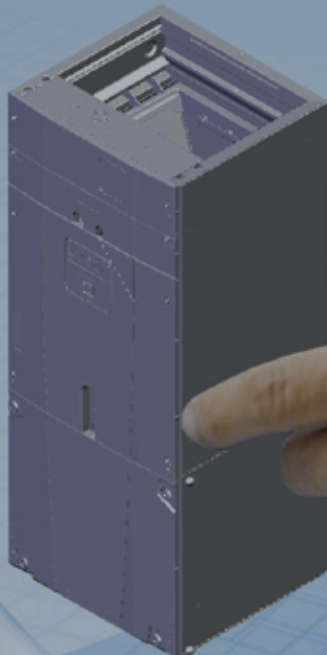


File Edit View Layout Windows Tools Help



Lin: Ignition
Lin: Optimization
Lin: Active
Lin: Acceleration

POSITION	VALUE
X	0.000000
Y	0.000000
Z	0.000000



Workplane: Section
Translation: Section



DESIGN

PLAN FOR PERFORMANCE

Unstoppable performance begins with uncompromising design. We start with the right materials and durable, top-quality, innovative parts, like our all-aluminum Spine Fin™ coils. We design features that lead to real-world benefits for dealers and homeowners alike. Finally, we design and invest in manufacturing processes worthy of the Trane name.

Outdoor Units — Air Conditioners and Heat Pumps

Trane's outdoor units are designed to provide superior energy-efficient cooling and quiet, reliable operation. We've designed down to the smallest detail, from the most complex parts to the most basic features, like the cabinet and basepan.



Spine Fin™ Coils

The novel design enhances airflow and heat transfer while resisting corrosion and leaks. These exclusive coils have proven far more reliable than traditional coils with copper and aluminum. Plus, aqueous glue releases fewer VOCs.



DuraTuff™ Rustproof Basepan

Basepan won't crack, corrode, rust, or warp.

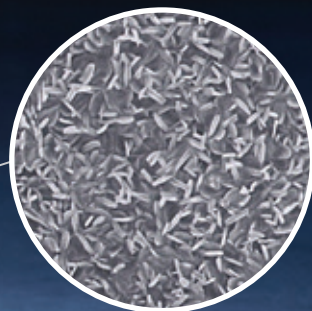
Quick Panel Removal

All of the panels can be removed in approximately 3 minutes by removing 14 screws for easy access to the unit.



Climatuff™ Variable Speed Compressor

The heart of Trane's variable speed technology, it automatically adjusts itself while maintaining constant and consistent comfort.



Powder-coated Exterior

Galvanized steel is treated with zinc phosphate, creating a gritty surface with which our electrostatically-charged powder coat paint bonds, fortifying the unit against the elements.

U.S. Naval Research Confirms Benefits of Aluminum

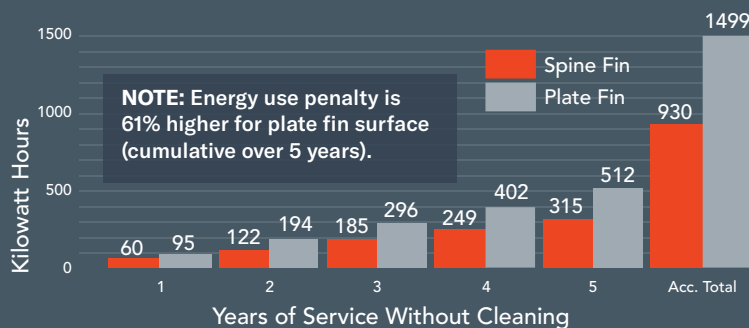
Heavy concentrations of salt and pollution in coastal and urban environments introduce substantial corrosion to heat exchangers. According to a study at the United States Navy Civil Engineering Laboratory, Naval Construction Battalion Center, aluminum construction resists corrosion better than conventional copper and steel construction.



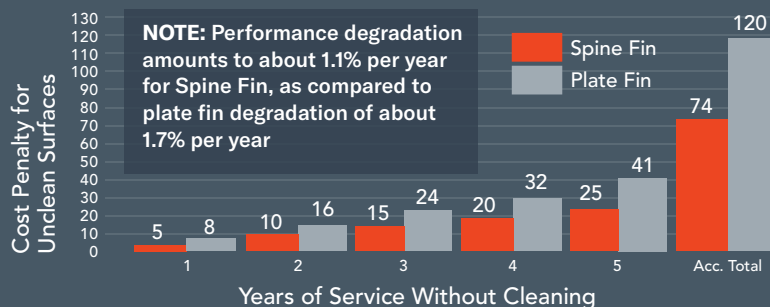
A 24-month study demonstrated that aluminum heat exchangers performed 32% better than those made with both copper and aluminum.

Purdue University Validates the Advantages of Spine Fin

ENERGY USE PENALTY due to contaminated condenser surfaces in 3-ton 10 SEER systems (1500 Hrs/Yr operation)



OPERATING COST PENALTY for contaminated condenser surfaces in 3-ton 10-SEER systems



Indoor Units – Air Handlers and Furnaces

Trane's multi-functional air handlers combine patented technology and flexibility to work with our complete range of heating and cooling products. Our furnaces are designed to deliver premium indoor comfort with precise control and come in a range of options to fit each unique application.



HYPERION

AIR HANDLER

Double-wall construction, enclosed foam insulation, and positive pressure airflow virtually eliminate sweating and condensation and improve air quality.

FEATURES

Vortica™ Blower*

The unique contoured edge increases airflow efficiency and reduces noise.

Variable-Speed Motor

with Comfort-R™ Technology*

The motor strategically ramps up airflow to minimize cold air during heating and dehumidification while cooling.

Easy Disassembly/Assembly

The composite cabinet can be disassembled either horizontally or vertically, separating the cabinet into two sections to fit into tight spaces.

Contained Insulation

No exposed fiberglass insulation means that loose particles won't enter the home's air system.

Double Sloped Drain Pan

Made from rust-resistant polycarbonate, the pan is designed to eliminate standing water and minimize microbial growth.



S9-SERIES

HIGH EFFICIENCY FURNACE

Design inspired by our very own dealers enables easier serviceability of parts like the heat exchanger, blower, and burners.

FEATURES

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Variable-Speed Motor

with Comfort-R™ Technology*

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Stainless Steel Primary Heat Exchanger

Stainless steel withstands higher temperatures, resists corrosion, and is efficient at heat transfer, while improving airflow efficiency in both winter and summer.

Formed Steel Door with Acrylic View Windows

Windows allow monitoring of key internal components without removing the door.

Multi-Port In-Shot Burners

Creates the optimal flame shape to provide maximum heat while using less fuel and reducing operating noise.

* Trane exclusive

Packaged Systems

With all-in-one HVAC systems that bundle heating and cooling in a single outdoor cabinet, packaged units offer simplified comfort. They are ideal for rooftop or ground installations.



HYBRID DUAL-FUEL PACKAGED UNIT

Efficient electric heat pump operation is supplemented by the gas furnace only if needed.

FEATURES

Vortica™ Blower*

The unique contoured edge increases airflow efficiency and reduces noise.

Variable-Speed Motor with Comfort-R™ Technology*

The motor strategically ramps up airflow to minimize cold air during heating and dehumidification while cooling.

All-aluminum Spine Fin™ Coil*

One continuous piece requires fewer brazed joints, so it offers extreme resistance to corrosion and leaks.

Simplified Maintenance and Serviceability

The compressor, blower, and controls are conveniently located on a single side, while accessible coils and foil-faced insulation make for easy cleaning.

Climatuff™ Two-Stage Compressor

Legendary reliability with two stages of cooling for efficiency and quiet operation.

Double Sloped Drain Pan

The slope minimizes standing water.

* Trane exclusive



Since 2018, Trane has offered ductless products through a joint venture with Mitsubishi Electric.

Corrosion-Resistant Coils



Our Comfort™ Coil is the industry's first truly reliable, all-aluminum indoor coil, leading the field in formicary corrosion prevention. That legacy of quality continues with our top-of-the-line autobrazing process.

Formicary Corrosion Test

In an accelerated formicary corrosion test, aluminum tubes (*below, left*) showed only minor surface corrosion after 127 days of exposure, while copper tubes (*below, right*) failed after 12 days.*

ALUMINUM



62x



500x

COPPER



62x



500x

After 500 hours of salt spray a galvanized steel tube sheet with copper tubing (*below, right*) shows substantial corrosion, while an all-aluminum tube sheet and tubes (*below, left*) shows virtually no corrosion.

ALUMINUM



COPPER



*Note: The test for formicary susceptibility of Alloys A (Aluminum) and C (Copper) was performed by Corrosion Testing Laboratories, Inc. in August 2004.





TESTING


PROVE OUR METAL

In order to wear the Trane badge, our units must survive a series of torturous tests.

We freeze, broil, stress, drop, shock, expose, and listen to our equipment – redesigning and retesting until it proves its reliability – because if it's going to carry the Trane name off the line, it must earn our unstoppable reputation.

SEET Tested™

SEET stands for System Extreme Environmental Test, and it's where we expose our equipment to the harshest conditions and situations you can imagine.



At our SEET Lab in Tyler, TX, we push our systems to the limit, trying to find any vulnerabilities so we can make them unstoppable. We subject them to bone-chilling cold, blistering heat, extreme moisture, and power fluctuations. They endure eight consecutive two-week sessions under accelerated conditions, adding up to more than 2,600 hours of continuous testing. That's years' worth of wear and tear concentrated into four months. All to ensure only the best, most reliable systems make it into our customers' homes.

SEET testing, round by round

ROUND 1

Voltage: Low



Heating Defrost with Snow and Ice

In this test, the system must heat while operating in sub-freezing conditions, including snow and ice. In order to pass, the coil must be free of ice buildup and the compressor must function under very stressful conditions such as defrost operation.

ROUND 2

Voltage: Nominal



Cooling with Fan Failure

By simulating outdoor fan failure, this test causes the system to cycle on overload and ensure it will restart after cooling down.

ROUND 3

Voltage: High



Minimum Load Heating

Simulating minimum refrigerant flow puts compressor bearings at seizure risk. Because of their innovative design, Climatuff® compressors have the velocity necessary to pull oil back in to lubricate all bearing surfaces.

ROUND 4

Voltage: Off



Power Shut-off

The system is shut down for 12 hours during which refrigerant migration can cause oil to drain or be washed off bearing surfaces. At the end of this round, we restart the system to confirm the compressor can operate with little or no oil pressure, similar to after a power outage or seasonal startup.

ROUND 5

Voltage: High



Cooling Maximum Load #1

This searing heat test forces the compressor to run continuously at high temperatures, removing excess indoor heat and sending it outside. The system is cycled and must restart and run without tripping off.

ROUND 6

Voltage: Nominal



Cooling Flood, Indoor Blower Off

This test subjects the compressor to the mechanical stresses of liquid refrigerant floodback, simulating gross system overcharge or blocked indoor airflow.

ROUND 7

Voltage: Low



Cooling Maximum Load #2

This test attempts to force the compressor to shut down under the stress of high load.

ROUND 8

Voltage: Off



Power Shut-off

The compressor is shut off and restarted with low bearing oil pressure, once again simulating a power outage or seasonal startup.

Tested, so it's Trusted

While the SEET Lab tests the performance of our systems as a whole, we're also continuously testing our equipment and components to make sure they meet our high standards.

From specialized testing to in-line manufacturing audits, we employ an extensive system of checks and balances to ensure the highest level of quality and reliability.

Here are some highlights from our comprehensive testing program:



Outdoor Units



Packaged Units



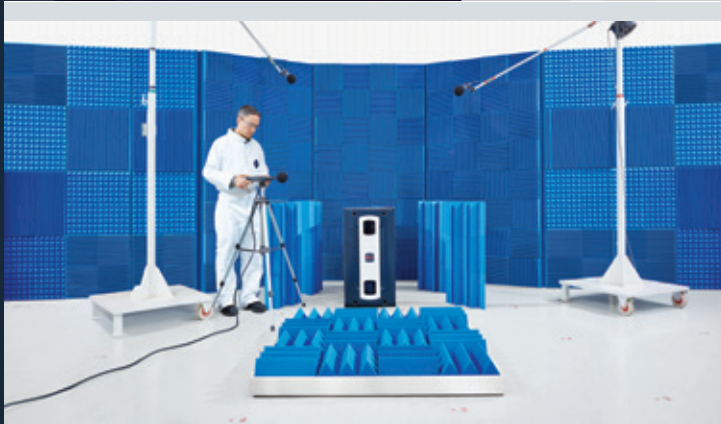
Furnaces



Air Handlers



Cased Coils



Sound Rooms



We have three sound rooms (including a Hemi-Anechoic Chamber that's structurally isolated from the surrounding building and insulated for sound) dedicated to testing the sound quality and power of our equipment and isolating potential sound problems. Our completely soundproof Reverberation Chamber is used to determine the acoustic performance of our products per AHRI testing standards.

Air Flow Plenums



Our Air Flow Plenum testing areas capture empirical performance data, enabling us to map the motor and fan for use in simulations and modeling as well as replicate and troubleshoot air flow issues in the field.



Gas Lab



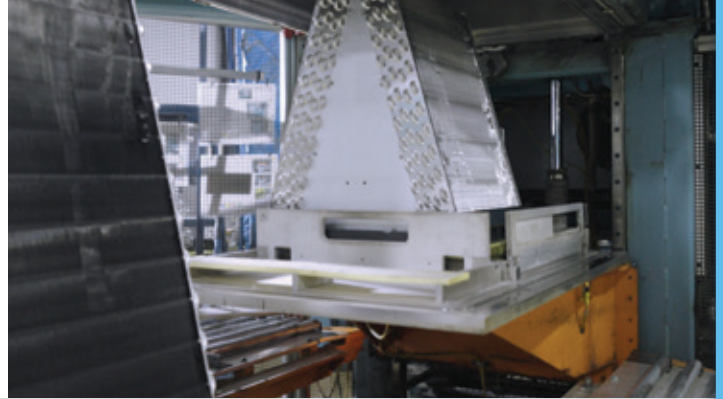
Twelve individual stands allow us to test our units using natural gas, propane, or butane. In addition to running dozens of ANSI performance tests and CSA, ET, and UL certifications, the lab supports product development, evaluates field issues, and establishes safety limits.



Mass Spectrometer Test



We double-braze the metals on our coil slabs to ensure an impermeable refrigerant circuit and then send it through our Mass Spectrometer's vacuum-sealed chamber to verify there are no leaks. To pass, the unit must have a leak rate of lower than .25 ounces/year — the equivalent of losing a 12 oz. can of refrigerant over 48 years.



Compressor Calorimeters



Our calorimeters measure power and refrigeration capacity to map compressor performance and allow for accurate system-level modeling and simulation. We also use them to evaluate and compare compressors from different suppliers.

Field Tests



Before introducing our products to the public, we put them through their paces in the real world, testing a wide range of scenarios and pushing the systems to their limit in the homes of our employees and channel partners. The information we collect leads to improved performance where it counts the most, with our homeowners.



End-of-Line Tests



All along our manufacturing lines, we test every unit and cycle all of its components. We also electronically verify key components, ensuring the correct parts are matched to their specific model. At the end, a computer sequences the unit through a series of run tests and only prints a shipping label for those that pass.

Shipping Tests



We run our equipment through a gauntlet of transportation tests, including the Shake Table, the Inclined Impactor, and the Drop Test. These tests simulate the various vibrations, slams, and drops our units — and their packaging — may encounter once they leave the safety of our factory.







KEEP PUSHING BOUNDARIES

Since 1885, we've been leading our industry — from Reuben Trane's invention of the convactor radiator, to transforming standard heat transfer with our legendary Spine Fin™ coils, to pioneering variable speed technology for residential air conditioning.

Today, we continue to lead, pairing our tested, trusted equipment with groundbreaking technology that revolutionizes comfort, making our homes and our planet more livable.

At Trane, we're always moving forward, searching for what's next, because the best never stops innovating.

Connected Comfort Solutions



DELIVERING NEXT-LEVEL INSIGHT AND CONTROL

Our Connected Comfort Solutions unlock the full potential of our systems, offering homeowners a new level of comfort, control, and peace of mind while providing our dealers with the tools to provide exceptional service and stand out from the competition.

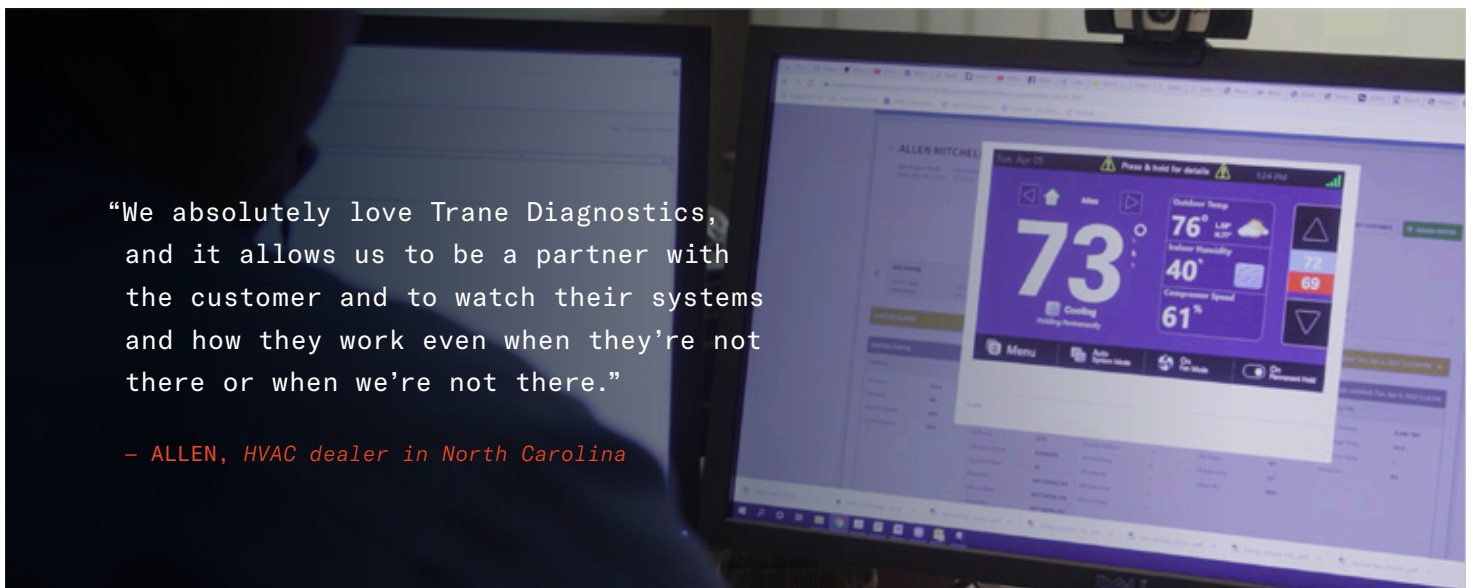
Trane Diagnostics

PROVIDING POWERFUL INSIGHT AND PROACTIVE SUPPORT

Trane Diagnostics allows dealers to remotely monitor an HVAC system's performance and can alert them of potential issues before the homeowner calls (or even knows there's an issue). Technicians can access real-time and historical performance data, allowing them to diagnose and grab the right parts before they head to a customer's house; and in some cases, avoid a service call altogether.

The insight provided by Trane Diagnostics empowers dealers to create stronger relationships with homeowners and more efficient service departments while building on our reputation as the most reliable brand in the industry.

To hear what dealers say about Diagnostics, scan this QR code.



“We absolutely love Trane Diagnostics, and it allows us to be a partner with the customer and to watch their systems and how they work even when they're not there or when we're not there.”

— ALLEN, HVAC dealer in North Carolina



Trane Link

ENHANCED INSIGHT GETS THE JOB DONE RIGHT

From the moment it's turned on through the life of the unit, Trane Link makes installation, maintenance, and service smarter with its revolutionary communication and diagnostics technology.

Link's set-up wizard and sensor-verified installs mean technicians of all skill levels can leave every job confident it was done right—which means fewer callbacks. With SmartCharge™, techs can connect and Link will automatically charge refrigerant to the correct levels — minimizing errors and freeing them up to do other work. The mobile app allows technicians to connect to system components through Bluetooth and verification reports provide peace-of-mind for both dealers and homeowners. Finally, additional sensors in Link-enabled equipment provide exponentially more data through Diagnostics.

To hear why dealers love Link, scan this QR code



“This Link equipment has enabled us to offer something of absolute intangible value. The only thing that’s going to prevent you from selling Link is not offering it.”

– MICHAEL, HVAC dealer in Florida

Trane Home App

COMFORT, CONTROLLED FROM ANYWHERE.

The Trane Home App, which is available for both Android and Apple, lets homeowners harness the power of their HVAC system and smart thermostat. They can program setpoint schedules and even adjust the temperature when they're not home — helping to save money and energy. When paired with Amazon Alexa and Google Home, the app allows customers to control their comfort with their voice.

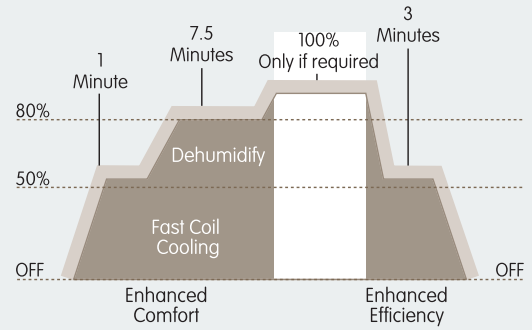
Finally, with Trane Home, users can allow dealers to access their home's system through Trane Diagnostics, for remote support and even troubleshooting.



To find out more about Trane Home, scan this QR code.



Connected Comfort Solutions



Trane Zoning Systems

COMFORT, EXACTLY WHERE YOU WANT IT.

Trane zoning systems use a network of controls, sensors, and motorized dampers to optimize temperature and humidity throughout a home. By delivering heat or cooling to the rooms that need it, these systems eliminate temperature fluctuations over the course of the day and provide consistent comfort year-round. Plus, the Trane Home app gives users the power to conveniently control each zone from the palm of their hand.

Comfort-R™ Technology

COMFORT, ALL YEAR ROUND.

Trane's exclusive Comfort-R technology optimizes humidity control in non-communicating systems with variable speed motors by linking the blower speed to a sophisticated humidity sensor, allowing systems to draw humid air more slowly over coils at the beginning of a cooling cycle. This capability, available only on Trane systems paired with a Trane thermostat, can remove up to four times as much moisture compared to a standard cooling system. With Comfort-R, air feels more comfortable more quickly with less heating or cooling.



Variable Speed Technology

COMFORT, WITHIN HALF A DEGREE

Trane pioneered variable speed technology back in 1989, and today we continue building on that innovation with enhanced communicating capabilities. Our variable speed units are our most efficient — capable of running at more than 700 different speeds* with incremental speed changes as small as 1/10th of 1% to maintain temp within a 1/2 degree. When paired with Trane Link, they offer next-level comfort with zoning and improved humidity control.

Plus, our refrigerant-cooled inverters keep electronic components at consistent temperatures, improving performance and reliability.



Trane Smart Thermostats

COMFORT, AT YOUR FINGERTIPS.

Trane's line of smart thermostats give homeowners the flexibility to automate, monitor, and control their comfort settings from anywhere, and reduce utility costs by setting a schedule or putting the system into energy-savings mode. Plus, when the homeowner connects their smart thermostat to the Trane Home mobile app, they can even change the temperature and adjust their settings when they're away from home.

Indoor Air Quality

MAKING HOMES HEALTHIER WITH CLEANER AIR

Over the past few years, homeowners have become increasingly aware of the importance of indoor air quality. They want their homes to be a refuge, free of the dust, allergens, mold, and viruses that can lead to illness and respiratory issues. Using the right air filtration system can dramatically reduce these undesirable particulates.



CleanEffects® Whole Home Air Cleaner

LEAVING HEPA FILTERS IN THE DUST

Trane CleanEffects removes up to 99.98% of airborne particles¹ and is the first whole home air cleaner certified asthma and allergy friendly by the Asthma and Allergy Foundation of America. It connects directly to a home's HVAC system, and because it uses a powerful, patented iFD Corona field to electrically charge and trap pollutants, air flows more freely and efficiently than through a filtered system.² It captures particles up to 700 times smaller than the width of the human hair,³ making it 100 times more effective than traditional filters and eight times more effective than medical-grade HEPA filtration systems.⁴

Learn more about CleanEffects by scanning this QR code.



Trane® Filters

TAKING THE WORRY OUT OF FILTER CHANGES

Trane has partnered with FilterTime™, making it easy for homeowners to keep their filters clean. Customers can order new filters — through their Trane Home app or at TraneFilters.com — one at a time, or through an ongoing subscription. The orders include free shipping and are generally shipped the same day. Regular filter changes not only help maintain cleaner, healthier air, but also help protect HVAC system health.

¹Based on 3rd party testing of particle removal efficiency down to 0.3 microns (2005) | ²As reported by airmid healthgroup in ASCR092142v2 (2015)
³Assuming <1% removal rate of 0.3–10 micron particles | ⁴Verified Zero Ozone per UL 2998, Intertek certificate #: ZOZ-90113-2022c

**Disclaimer: The CERTIFIED ASTHMA & ALLERGY FRIENDLY Mark is a Registered Certification Mark of the ASTHMA AND ALLERGY FOUNDATION OF AMERICA and ALLERGY STANDARDS LTD*

Reducing our Environmental Impact

WE'RE TAKING STEPS TO SHRINK OUR CARBON FOOTPRINT —

moving away from fossil fuels through fully electric and hybrid systems, offering more energy efficient products, incorporating more eco-friendly manufacturing processes, and dedicating countless hours to source lower Global Warming Potential refrigerants that exceed government regulations.

Transitioning to all-electric systems

We offer a range of solutions to help homeowners transition away from fossil fuels. To convert to all-electric, our P-Series air handler easily replaces a gas furnace and pairs with a heat pump. For colder climates, our versatile hybrid dual fuel systems increase energy efficiency while lowering reliance on natural gas. And to meet California state regulatory requirements, we offer an ultra-low NOx furnace.



Being responsible with refrigerant

We make it easy to return refrigerant recovered from HVAC equipment. Through Refrigerant Reclaim, dealers can exchange a cylinder of used refrigerant for a clean, empty one. In-demand refrigerants can be reused — and can bring rewards for dealers — and Trane will even properly dispose of mixed refrigerant.



Taking charge in Trenton

At our manufacturing facility in Trenton, New Jersey, we've installed the state's largest solar array – 5,500 panels generating nearly 2 million kilowatt-hours (kWh) of clean energy every year. We've also made changes inside, including a LED lighting project that reduces the facility's energy use by 1.5 million kWh annually.

Keeping waste out of landfills

Our Tyler, Texas plant is proud to be a Zero Waste to Landfill facility. We implement comprehensive strategies – focused on recycling, reusing, and repurposing – to make sure none of the manufacturing waste we generate ends up in a landfill.



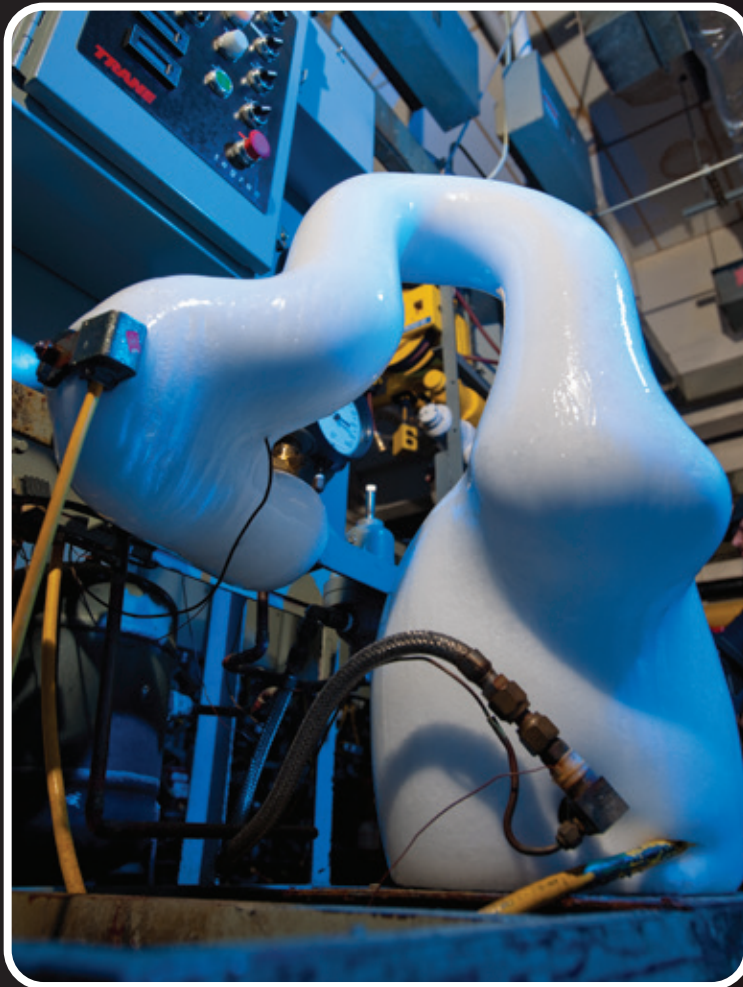
Choosing more responsible materials

We leverage recycled steel content, or “green steel”, which is 80% less carbon intensive than traditional steel, and we're taking action to drive market demand for low-carbon materials and tech.



SNOWBALL

AN ENDURING TRIBUTE TO OUR UNSTOPPABLE NATURE



Snowball was a compressor that was returned to us under warranty in 1972. Our technicians inspected and tested the unit, and it showed no signs of stopping. In fact, we ran Snowball continuously 24/7 for nearly 28 years at an estimated average of 3500 RPM — the equivalent of a car going 60 – 70 miles per hour — covering 14.8 million miles. Snowball set a high bar that we continue to set higher and higher.



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About Trane

Trane - by Trane Technologies (NYSE: TT), a global climate innovator - creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, visit [Trane.com](https://www.trane.com) or [TraneTechnologies.com](https://www.tranetechnologies.com)



RunTru by Trane provides an efficient and budget-friendly option that's backed by the support and service of a proven industry leader.

Why Trane?
Scan the QR code.

