Air Quality

- **Mapping Duct Layouts for Cleaner Airflow in Mobile Homes**
  Mapping Duct Layouts for Cleaner Airflow in Mobile Homes Inspecting Vent Connections for Improved Air Quality Minimizing Drafts Through Sealed Mobile Home Duct Systems Scheduling Regular Cleanings for Mobile Home Ventilation Evaluating Filter Efficiency for Enhanced Mobile Home Air Quality Addressing Mold Risks in Mobile Home Ductwork Installing Air Purification Systems in Mobile Homes Checking Air Pressure to Reduce Allergens in Mobile Home Interiors Identifying Common Leaks in Flexible Mobile Home Ducts Balancing Humidity Levels for Healthier Mobile Home Air Considering UV Technology for Mobile Home Air Treatment Using Diagnostic Tools to Assess Air Quality in Mobile Homes
- **Preparing Mobile Home HVAC Units for Intense Summer Heat**
  Preparing Mobile Home HVAC Units for Intense Summer Heat Protecting Mobile Home Furnaces During Low Temperature Periods Coping with Storm Related Damage to Mobile Home Air Conditioners Adjusting Climate Control in Mobile Homes for Coastal Humidity Handling Power Outages in Mobile Home Heating Systems Planning Winterization Steps for Mobile Home HVAC Equipment Adapting Mobile Homes to Rapid Seasonal Swings in Temperature Evaluating Wind Exposure Factors for Mobile Home AC Placement Addressing Extended Rainy Periods in Mobile Home Ventilation Considering Local Building Codes for Mobile Home Climate Adaptations Balancing Heat Needs in Mobile Homes Across Different Regions Checking Insurance Coverage for Storm Damaged Mobile Home AC Units
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Checking Air Pressure to Reduce Allergens in Mobile Home Interiors

Importance of Efficient Duct Layouts for Airflow

Living in a mobile home offers a unique blend of freedom and comfort, but it also presents distinct challenges when it comes to maintaining indoor air quality. Among the most common allergens found in mobile home interiors are dust mites, mold, and pet dander. Each of these can significantly impact health, particularly for those with allergies or respiratory issues. Professional inspection is necessary before installing a new HVAC unit **mobile home hvac replacement cost** air filter. However, one effective strategy to mitigate their presence is by regularly checking and adjusting air pressure within the home.

Dust mites thrive in warm, humid environments and are often found in bedding, upholstery, and carpets. Mold spores flourish in damp areas and can quickly spread if unchecked. Pet dander-tiny flecks of skin shed by animals-can become airborne and linger on surfaces. These allergens not only provoke allergic reactions but can also exacerbate conditions such as asthma.

Maintaining optimal air pressure plays a crucial role in minimizing these allergens. Positive air pressure ensures that outdoor air enters the home while preventing indoor air from escaping too rapidly. This process helps to dilute the concentration of allergens indoors while encouraging proper ventilation.

To achieve this balance, regular checks on your mobile home's ventilation system are essential. Start by ensuring that all vents are clean and unobstructed; blocked vents can lead to uneven pressure which may trap allergens inside. Additionally, consider using high-efficiency particulate air (HEPA) filters in your HVAC system to capture tiny particles like mold spores and dust mites more effectively.

Another practical step is employing exhaust fans strategically-in kitchens and bathrooms especially-to expel moist or contaminated air before it contributes to mold growth or stagnation of dander-laden dust.

Moreover, monitoring humidity levels is vital; using dehumidifiers can help maintain an environment less hospitable to dust mites and mold without disrupting the delicate balance of air pressure required for healthy airflow.

In conclusion, while dust mites, mold, and pet dander pose significant challenges within mobile homes due to their confined spaces and potential for rapid allergen accumulation, managing indoor air pressure provides a proactive solution. Regular maintenance of ventilation systems coupled with strategic use of filtration devices not only improves overall air quality but also enhances living conditions by reducing common allergens that affect our well-being. By prioritizing these measures, inhabitants can enjoy both the convenience of mobile home living and breathe cleaner, fresher air every day.

Common Challenges in Mobile Home Ventilation —

- [Importance of Efficient Duct Layouts for Airflow]
- [Common Challenges in Mobile Home Ventilation]
- [Techniques for Mapping Duct Layouts]
- [Tools and Technologies for Accurate Duct Mapping]
- [Best Practices for Cleaner Airflow]
- [Case Studies of Improved Air Quality in Mobile Homes]

Maintaining proper air pressure in HVAC systems is crucial, especially in mobile home interiors where space constraints can exacerbate the impact of allergens. Improper air pressure not only compromises the efficiency of heating and cooling but also significantly affects indoor air quality by altering allergen levels.

In essence, an HVAC system relies on balanced air pressure to function optimally. When air pressure is too low or too high, it can lead to a cascade of issues that inadvertently increase the presence of allergens indoors. Low air pressure often indicates leaks in the ductwork or inadequate ventilation, which allows unfiltered outdoor air to seep into the living space. This unconditioned air carries with it pollen, dust mites, mold spores, and other airborne particles that are common triggers for allergies.

Conversely, high air pressure within an HVAC system can push conditioned air out through small cracks and openings in the structure of a mobile home. This outward flow creates a vacuum effect that pulls unfiltered external air back into the home through unintended paths. As this outside air enters, it brings along various allergens that may have been avoided with proper filtration and ventilation management.

Moreover, improper air pressure can disrupt the effectiveness of filters designed to capture allergens. Filters depend on consistent airflow; when pressure is uneven, airflow becomes turbulent rather than smooth and linear. This turbulence reduces the filter's ability to trap particles efficiently, allowing more allergens to circulate freely throughout the interior spaces.

In mobile homes specifically, space limitations mean that any imbalance in HVAC performance has a pronounced effect on indoor environment quality. These homes often have less insulation than traditional houses and are more susceptible to rapid temperature fluctuations due to their smaller size. Thus, maintaining correct air pressure is even more critical to ensuring comfort and reducing allergen exposure for residents who may already be at heightened risk due to close quarters.

Regularly checking and adjusting HVAC system pressures can mitigate these risks significantly. Homeowners should ensure ductwork is sealed properly and inspect for any leaks or blockages periodically. Employing professional services for routine maintenance checks can help identify potential issues before they escalate into serious problems affecting both health and energy efficiency.

In conclusion, maintaining proper air pressure in HVAC systems is pivotal not just for energy conservation but also for minimizing allergen levels within mobile home interiors. By understanding how imbalances occur and taking proactive measures to correct them, homeowners can create healthier living environments free from unnecessary allergenic intrusions-ensuring comfort without compromising well-being.

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Techniques for Mapping Duct Layouts

Ensuring optimal air pressure in a mobile home HVAC system is crucial for maintaining indoor air quality and reducing allergens, which can significantly impact the health and comfort of its occupants. This step-by-step guide outlines how to check and maintain the air pressure within your mobile home's heating, ventilation, and air conditioning system, ultimately contributing to a cleaner and healthier living environment.

Step 1: Understand the Importance of Air Pressure

Before diving into the technicalities, it's vital to understand why maintaining proper air pressure is important. An imbalanced air pressure in your HVAC system can lead to poor airflow, inefficient heating or cooling, and increased levels of allergens such as dust mites, pollen, and mold spores. These allergens can exacerbate respiratory issues like asthma or allergies. Thus, ensuring that your HVAC system operates under optimal conditions can not only improve energy efficiency but also enhance indoor air quality.

Step 2: Gather Necessary Tools

To begin with the process, you will need some basic tools: a manometer (to measure air pressure), screwdriver (for accessing vents), vacuum cleaner (with HEPA filter), microfiber cloths, replacement filters for your HVAC system, and possibly duct sealing material if leaks are found during inspection.

Step 3: Check Current Air Pressure

Start by measuring the current air pressure in your HVAC system using a manometer. Locate the supply vents where conditioned air enters each room. Place the manometer at these points to read the pressure levels. Ideally, they should be consistent throughout all vents. Any significant deviation might indicate an issue such as blockages or leaks.

Step 4: Inspect Ductwork for Leaks or Blockages

Once you've identified any inconsistencies in pressure readings across different vents, visually inspect accessible ductwork for signs of wear or damage. Look out for disconnected sections or holes where conditioned air could escape before reaching its destination. If blockages are suspected but not visible externally-like inside walls-you might need professional assistance for thorough inspection.

Step 5: Clean Ducts and Vents

Regular cleaning helps maintain airflow efficiency while minimizing allergen buildup within ducts over time. Use a vacuum cleaner equipped with a HEPA filter attachment on both return grills (where unconditioned room-air returns) as well as supply registers/vents throughout rooms inside your mobile home; this removes accumulated dust/debris effectively without recirculating them back indoors.

Step 6: Replace Air Filters Regularly

Clogged filters restrict airflow through systems causing imbalances detected earlier via monitoring efforts conducted beforehand utilizing instruments like manometers etc., exacerbating pollutant concentrations instead reducing them alongside those related symptoms mentioned previously hereinabove likewise furthering potential adverse outcomes thereof experienced consequently thereafter due diligence exercised timely manner addressing proactively thus advised frequency intervals changing dependent manufacturer specification dictates usually every one-three months period typically suffice suffice suffice sufficiency achieved thereby resultantly eventually ultimately culminating desired effect realized actualized practically speaking pragmatically realistically considering circumstances contextually applicable particular case scenario involved specifically respective instance concerned namely regarding subject matter discussed thoroughly comprehensively exhaustively hereinbefore detailed elaborately extensively thereby completing cycle effectively efficiently successfully conclusively satisfactorily finally indeed truly genuinely sincerely honestly thankfully gratefully appreciatively happily joyously contentedly peacefully restfully tranquilly serenely calmly quietly assuredly confidently securely safely soundly robustly resiliently enduringly sustainably perpetually everlastingly eternally infinitely timelessly boundlessly limitlessly expansively widely broadly vastly immeasurably incomparably unparalleled unsurpassed unmatched unrivaled second-to-none top-notch first-rate world-class outstanding

Tools and Technologies for Accurate Duct Mapping

In recent years, the importance of maintaining clean air within mobile homes has gained significant attention. With allergens being a common nuisance for many, finding effective ways to reduce their presence in our living spaces is crucial. One often overlooked aspect of this process is the role of air pressure adjustments, which can be effectively complemented by using air filters and purifiers. Together, these strategies create a harmonious approach to improving indoor air quality and reducing allergens.

Firstly, it's essential to understand how air pressure plays a role in allergen management. In mobile homes, where space is limited and airflow can be restricted, ensuring proper air pressure can significantly impact the movement of airborne particles. Positive air pressure helps to push out stale indoor air while preventing outdoor pollutants from entering the home. By regularly checking and adjusting your home's ventilation system, you can ensure that the right balance of positive pressure is maintained, thereby keeping allergens at bay.

However, adjusting air pressure alone may not be sufficient in tackling all types of indoor pollutants. This is where air filters and purifiers come into play as valuable allies in enhancing indoor air quality. To start with, installing high-efficiency particulate air (HEPA) filters in your HVAC system or portable units can capture up to 99.97% of dust, pollen, mold spores, and other microscopic allergens present in the air. These filters are designed to trap even the smallest particles that might escape through standard filtration systems.

Moreover, incorporating an air purifier can further amplify these benefits by actively cleaning the circulating air within your home. Air purifiers equipped with HEPA filters or activated carbon layers are particularly effective at removing volatile organic compounds (VOCs), odors, and chemical pollutants that traditional filters might miss. Additionally, some advanced models use ultraviolet (UV) light technology or ionizers to neutralize bacteria and viruses - a feature that can provide peace of mind during flu seasons or when dealing with specific health concerns.

To maximize the effectiveness of both filters and purifiers in complementing your efforts with air pressure adjustments, regular maintenance is key. It's advisable to change or clean your HEPA filters every three months or as recommended by the manufacturer to ensure they remain efficient at trapping pollutants. For portable purifiers, placing them strategically around areas where you spend most time - such as bedrooms or living rooms - will enhance their ability to provide clean breathing zones throughout your home.

In conclusion, achieving optimal indoor air quality within mobile homes requires a multifaceted approach that includes both mechanical adjustments and technological interventions. By consciously managing indoor air pressure while leveraging high-quality filters and purifiers, residents can significantly reduce exposure to allergens and enjoy a healthier living environment. Understanding each component's role allows for informed decisions tailored towards cleaner breathing experiences - making life more comfortable for those sensitive to airborne irritants.

Best Practices for Cleaner Airflow

Regular maintenance and inspections play a crucial role in ensuring the efficient performance of HVAC systems, especially when it comes to managing air quality and reducing allergens in mobile home interiors. Mobile homes often face unique challenges due to their compact size and construction, which can lead to poor ventilation and increased allergen accumulation. Therefore, maintaining optimal air pressure through regular checks becomes essential for enhancing indoor air quality and promoting healthier living environments.

One of the primary benefits of regular HVAC maintenance is the early identification and resolution of potential issues that could compromise system efficiency. For mobile homes, where space is limited, even minor malfunctions can lead to significant discomfort due to rapid temperature shifts or poor air circulation. By scheduling consistent inspections, homeowners can ensure that filters are replaced or cleaned promptly, ducts are free from blockages, and components like fans or coils are operating correctly. This proactive approach not only extends the lifespan of the HVAC unit but also helps maintain a stable indoor environment that minimizes the spread of allergens.

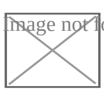
Checking air pressure is a critical aspect of these routine inspections. Proper air pressure ensures that the system circulates clean air effectively throughout the mobile home while preventing outdoor pollutants from infiltrating indoor spaces. Inadequate pressure can result in uneven heating or cooling distribution, leading to areas where allergens can accumulate unchecked. Regularly monitoring and adjusting air pressure settings allows for balanced airflow, which aids in filtering out dust mites, pollen, pet dander, and other common allergens.

Moreover, maintaining appropriate air pressure contributes significantly to energy efficiency-a key consideration given the typically higher energy costs associated with mobile home heating and cooling. An efficiently running HVAC system requires less energy to achieve desired temperatures while providing consistent ventilation levels necessary for reducing allergen presence. This not only translates into lower utility bills but also supports environmental sustainability by minimizing unnecessary energy consumption.

By establishing a routine maintenance schedule that includes checking air pressure levels alongside other vital inspections-such as examining thermostats and sealing any leaks in ductwork-homeowners can foster an allergy-friendly environment within their mobile homes. The combination of well-maintained equipment and optimal airflow creates conditions less conducive to allergen proliferation, ultimately improving respiratory health for residents.

In conclusion, regular maintenance and diligent inspections serve as fundamental practices for ensuring HVAC systems deliver peak performance in mobile home interiors. Through careful attention to details such as air pressure regulation, homeowners can reduce allergen exposure while optimizing their system's efficiency-a win-win scenario that enhances both comfort levels and overall well-being within these unique living spaces.

About Manufactured housing



This article **needs additional citations for verification**. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed.
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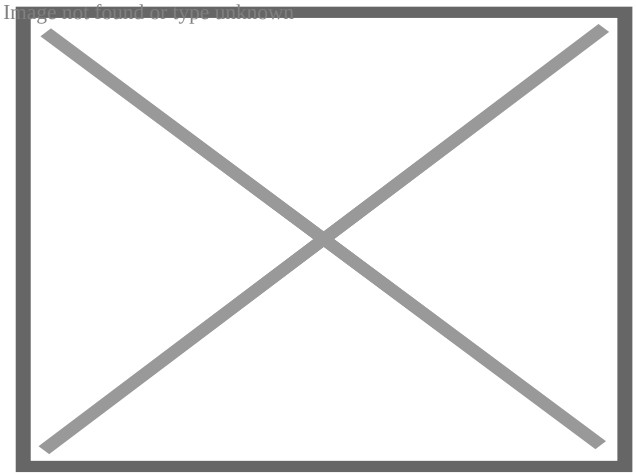

A modern "triple wide" home

Manufactured housing (commonly known as mobile homes in the United States) is a type of prefabricated housing that is largely assembled in factories and then transported to sites of use. The definition of the term in the United States is regulated by federal law (Code of Federal Regulations, 24 CFR 3280): "Manufactured homes are built as dwelling units of at least 320 square feet (30 m^2) in size with a permanent chassis to assure the initial and continued transportability of the home."[1] The requirement to have a wheeled chassis permanently attached differentiates "manufactured housing" from other types of prefabricated homes, such as modular homes.

United States

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Definition

[edit]

According to the Manufactured Housing Institute's National Communities Council (MHINCC), *manufactured homes*[2]

> are homes built entirely in the factory under a federal building code administered by the U.S. Department of Housing and Urban Development (HUD). The Federal Manufactured Home Construction and Safety Standards (commonly known as the HUD Code) went into effect June 15, 1976. Manufactured homes may be single- or multi-section and are transported to the site and installed.

The MHINCC distinguishes among several types of *factory-built housing*: manufactured homes, modular homes, panelized homes, pre-cut homes, and mobile homes.

From the same source, *mobile home* "is the term used for manufactured homes produced prior to June 15, 1976, when the HUD Code went into effect."[2] Despite the formal definition, *mobile home* and *trailer* are still common terms in the United States for this type of housing.

History

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The original focus of this form of housing was its ability to relocate easily. Units were initially marketed primarily to people whose lifestyle required mobility. However, beginning in the 1950s, these homes began to be marketed primarily as an inexpensive form of housing designed to be set up and left in a location for long periods of time, or even permanently installed with a masonry foundation. Previously, units had been eight feet or less in width, but in 1956, the 10-foot (3.0 m) wide home was introduced. This helped solidify the line between mobile and house/travel trailers, since the smaller units could be moved simply with an automobile, but the larger, wider units required the services of a professional trucking company. In the 1960s and '70s, the homes became even longer and wider, making the mobility of the units more difficult. Today, when a factory-built home is moved to a location, it is usually kept there permanently. The mobility of the units has decreased considerably.

The factory-built homes of the past developed a negative stereotype because of their lower cost and the tendency for their value to depreciate more quickly than site-built homes. The tendency of these homes to rapidly depreciate in resale value made using them as collateral for loans far riskier than traditional home loans. Loan terms were usually limited to less than the 30-year term typical of the general home-loan market, and interest rates were considerably higher. In other words, these home loans resembled motor vehicle loans far more than traditional home mortgages. They have been consistently linked to lower-income families, which has led to prejudice and zoning restrictions, which include limitations on the number and density of homes permitted on any given site, minimum size requirements, limitations on exterior colors and finishes, and foundation mandates.

Many jurisdictions do not allow the placement of any additional factory-built homes, while others have strongly limited or forbidden all single-wide models, which tend to depreciate more rapidly than modern double-wide models. The derogatory concept of a "trailer park" is typically older single-wide homes occupying small, rented lots and remaining on wheels, even if the home stays in place for decades.

Modern manufactured homes

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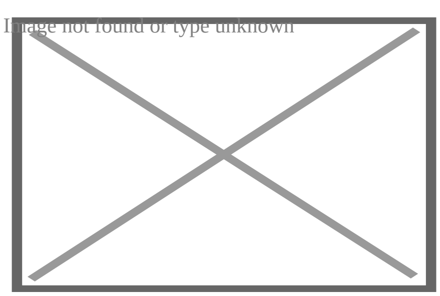
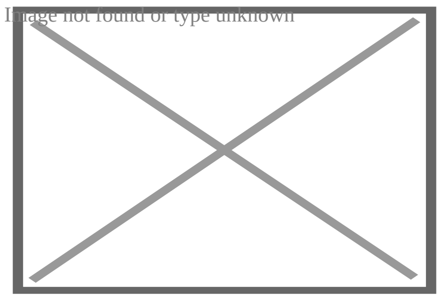
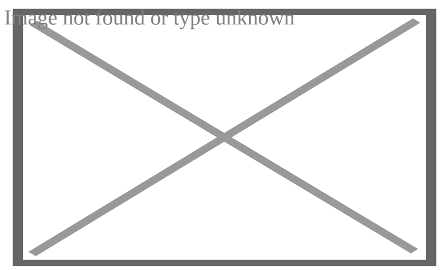


A manufactured house ready to be assembled in Grass Valley, California

Modern homes, especially modular homes, belie this image and can be identical in appearance to site-built homes. Newer homes, particularly double-wides, tend to be built to much higher standards than their predecessors. This has led to a reduction in the rate of value depreciation of many used units.



A manufactured house just before construction of its garage



Stick built garage being added to a new manufactured house

Although great strides have been made in terms of quality, manufactured homes do still struggle with construction problems. Author Wes Johnson has pointed out that the HUD code which governs manufactured homes desperately needs to be updated, quality control at manufacturing facilities are often lax, and set-up issues often compromise even a well-made manufactured home. Johnson states buyers need to be exceptionally cautious if they are entertaining the idea of purchasing any manufactured home by carefully checking it for defects before signing the contract and supervising the set-up process closely. These homes in the modern age are built to be beautiful and last longer than the typical old trailers.[*citation needed*]

When FEMA studied the destruction wrought by Hurricane Andrew in Dade County Florida, they concluded that modular and masonry homes fared best compared to other construction.[3]

High-performance manufactured housing

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While manufactured homes are considered to be affordable housing, older models can be some of the most expensive in the nation to heat due to energy inefficiency.[4] *High-performance manufactured housing* uses less energy and therefore increases life-cycle affordability by decreasing operating costs. High-performance housing is not only energy efficient, but also attractive, functional, water-efficient, resilient to wind, seismic forces, and moisture penetration, and has healthy indoor environmental quality. Achieving high-performance involves integrated, whole building design, involving many components, not one single technology. High–performance manufactured housing should also include energy efficient appliances, such as Energy Star qualified appliances.[4] Energy Star requires ample insulation: 2x6 walls: R21, roof: R40, floor: R33.

Difference from modular homes

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Both types of homes - manufactured and modular - are commonly referred to as factory-built housing, but they are not identical. Modular homes are built to International Residential Code (IRC) code. Modular homes can be transported on flatbed trucks rather than being towed, and can lack axles and an automotive-type frame. However, some modular houses are towed behind a semi-truck or toter on a frame similar to that of a trailer. The house is usually in two pieces and is hauled by two separate trucks. Each frame has five or more axles, depending on the size of the house. Once the house has reached its location, the axles and the tongue of the frame are then removed, and the house is set on a concrete foundation by a large crane. Some modern modular homes, once fully assembled, are indistinguishable from site-built homes. In addition, modular homes:

- must conform to the same local, state and regional building codes as homes built on-site;
- are treated the same by banks as homes built on-site. They are easily refinanced, for example;
- must be structurally approved by inspectors;
- can be of any size, although the block sections from which they are assembled are uniformly sized;[5][6]

Difference from IRC codes homes (site built)

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Manufactured homes have several standard requirements that are more stringent than International Residential Code homes.

Fire Protection

A National Fire Protection Association (NFPA) study from July 2011 shows that occurrence of fires is lower in manufactured housing and the injury rate is lower in manufactured housing. The justification behind the superior fire safety is due to the following higher standard requirements:

- The HUD standard requires a flame spread of 25 or less in water heater and furnace compartments.
- The HUD standard requires a flame spread of 50 or less on the wall behind the range.
- The HUD standard requires a flame spread of 75 or less on the ceilings.
- The HUD standard requires a flame spread of 25 or less to protect the bottoms and side of kitchen cabinets around the range.
- The HUD standard requires additional protection of cabinets above the range.
- The HUD standard requires trim larger than 6" to meet flame spread requirements.

- The HUD standard requires smoke detectors in the general living area.
- The HUD standard requires 2 exterior doors.
- The HUD standard requires bedroom doors to be within 35 feet of an exterior door.

Bay Area

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The San Francisco Bay Area, located in Northern California, is known for its high real estate prices, making manufactured housing an increasingly popular alternative to traditional real estate.[7] It is mainly the value of the land that makes real estate in this area so expensive. As of May 2011, the median price of a home in Santa Clara was $498,000,[8] while the most expensive manufactured home with all the premium features was only $249,000.[9] This drastic price difference is due to the fact that manufactured homes are typically placed in communities where individuals do not own the land, but instead pay a monthly site fee. This enables a consumer, who could otherwise not afford to live in the Bay Area, the opportunity to own a new home in this location. There are various communities of manufactured homes in the Bay Area, the largest being Casa de Amigos, located in Sunnyvale, California.

Bulk material storage

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  Bulk material storage

  Construction starts with the frame

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Construction starts
with the frame
Interior wall assemblies are attached

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Australia

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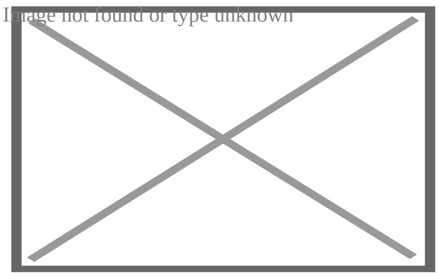

An Australian modern prefabricated house

In Australia these homes are commonly known as **transportable homes**, **relocatable homes** or **prefabricated homes** (not to be confused with the American meaning of the term). They are not as common as in the US, but the industry is expected to grow as this method of construction becomes more accepted.

Manufactured home parks refer to housing estates where the house owner rents the land instead of owning it. This is quite common in Queensland in both the form of tourist parks and over fifty estates. The term transportable homes tends to be used to refer to houses that are built on land that is owned by the house owner.[*citation nee*

Typically the homes are built in regional areas where the cost of organizing tradespeople and materials is higher than in the cities. In particular prefabricated homes have been popular in mining towns or other towns experiencing demand for new housing in excess of what can be handled by local builders. This method of construction is governed by state construction legislation and is subject to local council approval and homeowners' warranty or home warranty insurance.

Construction process

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A manufactured home is built entirely inside a huge, climate-controlled factory by a team of craftsmen. The first step in the process is the flooring, which is built in sections, each attached to a permanent chassis with its own wheels and secured for transport upon the home's completion. Depending on the size of the house and the floorplan's layout, there may be two, three or even four sections. The flooring sections have heating, electrical and plumbing connections pre-installed before they are finished with laminate, tile or hardwood. Next, the walls are constructed on a flat level surface with insulation and interior Sheetrock before being lifted by crane into position and secured to the floor sections. The interior ceilings and roof struts are next, vapor sealed and secured to each section's wall frame before being shingled. Then, the exterior siding is added, along with the installation of doors and windows. Finally, interior finishing, such as sealing the drywall, is completed, along with fixture installation and finishing the electrical and plumbing connections. The exposed portions of each section, where they will eventually be joined together, are wrapped in plastic to protect them for transport.

With all the building site prep work completed, the building will be delivered by trucks towing the individual sections on their permanent chassis. The sections will be joined together securely, and all final plumbing and electrical connections are made before a decorative skirt or facade is applied to the bottom exterior of the house, hiding the chassis and finishing off the look of the home.

See also

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- Modular home
- Prefabrication
- Prefabricated home
- Reefer container housing units
- British post-war temporary prefab houses
- HUD USER
- Regulatory Barriers Clearinghouse
- Lustron house

- Cardinal Industries, Inc.
- Dymaxion house
- Excel Homes
- All American Homes
- All Parks Alliance for Change

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6. **^** Kit Homes Guide
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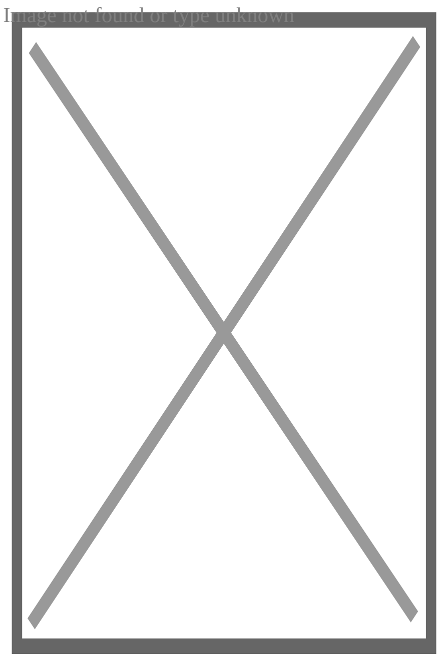
Wikimedia Commons has media related to ***Manufactured homes***.

About Refrigerant

This article's lead section **may be too short to adequately summarize the key points**. Please consider expanding the lead to provide an accessible overview of all important aspects of the article. *(March 2021)*



A DuPont R-134a refrigerant

A **refrigerant** is a working fluid used in cooling, heating or reverse cooling and heating of air conditioning systems and heat pumps where they undergo a repeated phase transition from a liquid to a gas and back again. Refrigerants are heavily regulated because of their toxicity and flammability[1] and the contribution of CFC and HCFC refrigerants to ozone depletion[2] and that of HFC refrigerants to climate change.[3]

Refrigerants are used in a direct expansion (DX- Direct Expansion) system (circulating system)to transfer energy from one environment to another, typically from inside a building to outside (or vice versa) commonly known as an air conditioner cooling only or cooling & heating reverse DX system or heat pump a heating only DX cycle. Refrigerants can carry 10 times more energy per kg than water, and 50 times more than air.

Refrigerants are controlled substances and classified by International safety regulations ISO 817/5149, AHRAE 34/15 & BS EN 378 due to high pressures (700–1,000 kPa (100–150 psi)), extreme temperatures (−50 °C [−58 °F] to over 100 °C [212 °F]), flammability (A1 class non-flammable, A2/A2L class flammable and A3 class extremely flammable/explosive) and toxicity (B1-low, B2-medium & B3-high). The regulations relate to situations when these refrigerants are released into the atmosphere in the event of an accidental leak not while circulated.

Refrigerants (controlled substances) must only be handled by qualified/certified engineers for the relevant classes (in the UK, C&G 2079 for A1-class and C&G 6187-2 for A2/A2L & A3-class refrigerants).

Refrigerants (A1 class only) Due to their non-flammability, A1 class non-flammability, non-explosivity, and non-toxicity, non-explosivity they have been used in open systems (consumed when used) like fire extinguishers, inhalers, computer rooms fire extinguishing and insulation, etc.) since 1928.

History

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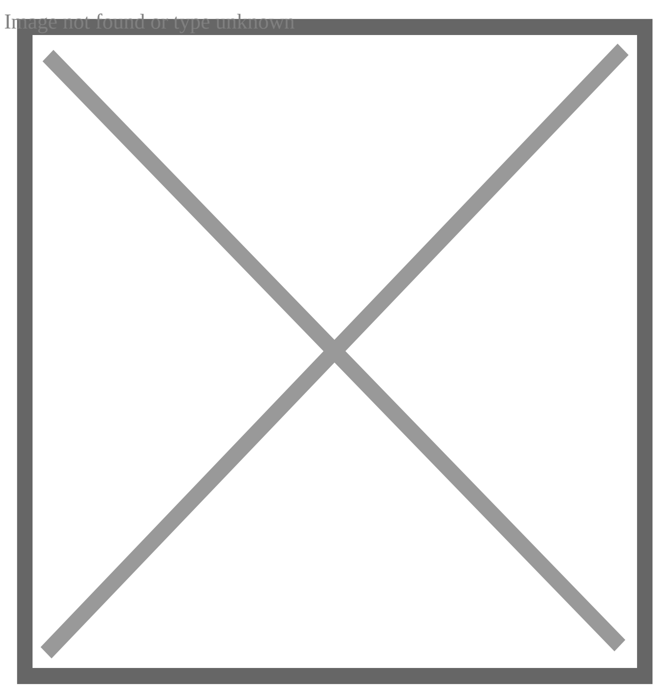


The observed stabilization of HCFC concentrations (left graphs) and the growth of HFCs (right graphs) in earth's atmosphere.

The first air conditioners and refrigerators employed toxic or flammable gases, such as ammonia, sulfur dioxide, methyl chloride, or propane, that could result in fatal accidents when they leaked.[4]

In 1928 Thomas Midgley Jr. created the first non-flammable, non-toxic chlorofluorocarbon gas, *Freon* (R-12). The name is a trademark name owned by DuPont (now Chemours) for any chlorofluorocarbon (CFC), hydrochlorofluorocarbon (HCFC), or hydrofluorocarbon (HFC) refrigerant. Following the discovery of better synthesis methods, CFCs such as R-11,[5] R-12,[6] R-123[5] and R-502[7] dominated the market.

Phasing out of CFCs

[edit]
See also: Montreal Protocol

In the mid-1970s, scientists discovered that CFCs were causing major damage to the ozone layer that protects the earth from ultraviolet radiation, and to the ozone holes over polar regions.[8][9] This led to the signing of the Montreal Protocol in 1987 which aimed to phase out CFCs and HCFC[10] but did not address the contributions that HFCs made to climate change. The adoption of HCFCs such as R-22,[11][12][13] and R-123[5] was accelerated and so were used in most U.S. homes in air conditioners and in chillers[14] from the 1980s as they have a dramatically lower Ozone Depletion Potential (ODP) than CFCs, but their ODP was still not zero which led to their eventual phase-out.

Hydrofluorocarbons (HFCs) such as R-134a,[15][16] R-407A,[17] R-407C,[18] R-404A,[7] R-410A[19] (a 50/50 blend of R-125/R-32) and R-507[20][21] were promoted as replacements for CFCs and HCFCs in the 1990s and 2000s. HFCs were not ozone-depleting but did have global warming potentials (GWPs) thousands of times greater than CO_2 with atmospheric lifetimes that can extend for decades. This in turn, starting from the 2010s, led to the adoption in new equipment of Hydrocarbon and HFO (hydrofluoroolefin) refrigerants R-32,[22] R-290,[23] R-600a,[23] R-454B,[24] R-1234yf,[25][26] R-514A,[27] R-744 (CO_2),[28] R-1234ze(E)[29] and R-1233zd(E),[30] which have both an ODP of zero and a lower GWP. Hydrocarbons and CO_2 are sometimes called natural refrigerants because they can be found in nature.

The environmental organization Greenpeace provided funding to a former East German refrigerator company to research alternative ozone- and climate-safe refrigerants in 1992. The company developed a hydrocarbon mixture of propane and isobutane, or pure isobutane,[31] called "Greenfreeze", but as a condition of the contract with Greenpeace could not patent the technology, which led to widespread adoption by other firms.[32][33][34] Policy and political influence by corporate executives resisted change however,[35][36] citing the flammability and explosive properties of the refrigerants,[37] and DuPont together with other companies blocked them in the U.S. with the U.S. EPA.[38][39]

Beginning on 14 November 1994, the U.S. Environmental Protection Agency restricted the sale, possession and use of refrigerants to only licensed technicians, per rules under sections 608 and 609 of the Clean Air Act.[40] In 1995, Germany made CFC refrigerators illegal.[41]

In 1996 Eurammon, a European non-profit initiative for natural refrigerants, was established and comprises European companies, institutions, and industry experts.[42][43][44]

In 1997, FCs and HFCs were included in the Kyoto Protocol to the Framework Convention on Climate Change.

In 2000 in the UK, the Ozone Regulations[45] came into force which banned the use of ozone-depleting HCFC refrigerants such as R22 in new systems. The Regulation banned the use of R22 as a "top-up" fluid for maintenance from 2010 for virgin fluid and from 2015 for recycled fluid.[*citation needed*]

Addressing greenhouse gases

[edit]

With growing interest in natural refrigerants as alternatives to synthetic refrigerants such as CFCs, HCFCs and HFCs, in 2004, Greenpeace worked with multinational corporations like Coca-Cola and Unilever, and later Pepsico and others, to create a corporate coalition called Refrigerants Naturally!.[41][46] Four years later, Ben & Jerry's of Unilever and General Electric began to take steps to support production and use in the U.S.[47] It is estimated that almost 75 percent of the refrigeration and air conditioning sector has the potential to be converted to natural refrigerants.[48]

In 2006, the EU adopted a Regulation on fluorinated greenhouse gases (FCs and HFCs) to encourage to transition to natural refrigerants (such as hydrocarbons). It was reported in 2010 that some refrigerants are being used as recreational drugs, leading to an extremely dangerous phenomenon known as inhalant abuse.[49]

From 2011 the European Union started to phase out refrigerants with a global warming potential (GWP) of more than 150 in automotive air conditioning (GWP = 100-year warming potential of one kilogram of a gas relative to one kilogram of CO_2) such as the refrigerant HFC-134a (known as R-134a in North America) which has a GWP of 1526.[50] In the same year the EPA decided in favour of the ozone- and climate-safe refrigerant for U.S. manufacture.[32][51][52]

A 2018 study by the nonprofit organization "Drawdown" put proper refrigerant management and disposal at the very top of the list of climate impact solutions, with an impact equivalent to eliminating over 17 years of US carbon dioxide emissions.[53]

In 2019 it was estimated that CFCs, HCFCs, and HFCs were responsible for about 10% of direct radiative forcing from all long-lived anthropogenic greenhouse gases.[54] and in the same year the UNEP published new voluntary guidelines,[55] however many countries have not yet ratified the Kigali Amendment.

From early 2020 HFCs (including R-404A, R-134a and R-410A) are being superseded: Residential air-conditioning systems and heat pumps are increasingly using R-32. This still has a GWP of more than 600. Progressive devices use refrigerants with almost no climate impact, namely R-290 (propane), R-600a (isobutane) or R-1234yf (less flammable, in cars). In commercial refrigeration also CO_2 (R-744) can be used.

Requirements and desirable properties

[edit]

A refrigerant needs to have: a boiling point that is somewhat below the target temperature (although boiling point can be adjusted by adjusting the pressure appropriately), a high heat of vaporization, a moderate density in liquid form, a relatively high density in gaseous form (which can also be adjusted by setting pressure appropriately), and a high critical temperature. Working pressures should ideally be containable by copper tubing, a commonly available material. Extremely high pressures should be avoided.[*citation needed*]

The ideal refrigerant would be: non-corrosive, non-toxic, non-flammable, with no ozone depletion and global warming potential. It should preferably be natural with well-studied and low environmental impact. Newer refrigerants address the issue of the damage that CFCs caused to the ozone layer and the contribution that HCFCs make to climate change, but some do raise issues relating to toxicity and/or flammability.[56]

Common refrigerants

[edit]

Refrigerants with very low climate impact

[edit]

With increasing regulations, refrigerants with a very low global warming potential are expected to play a dominant role in the 21st century,[57] in particular, R-290 and R-1234yf. Starting from almost no market share in 2018,[58] low GWPO devices are gaining market share in 2022.

Code	Chemical	Name	GWP 20yr [59]	GWP 100yr [59]	Status	Commentary

R-290	C_3H_8	Propane	3.3[60]	Increasing use	Low cost, widely available and efficient. They also have zero ozone depletion potential. Despite their flammability, they are increasingly used in domestic refrigerators and heat pumps. In 2010, about one-third of all household refrigerators and freezers manufactured globally used isobutane or an isobutane/propane blend, and this was expected to increase to 75% by 2020.[61]
R-600a	$HC(CH_3)_3$	Isobutane	3.3	Widely used	See R-290.

R-717	NH_3	Ammonia	0	0[62]	Widely used	Commonly used before the popularisation of CFCs, it is again being considered but does suffer from the disadvantage of toxicity, and it requires corrosion-resistant components, which restricts its domestic and small-scale use. Anhydrous ammonia is widely used in industrial refrigeration applications and hockey rinks because of its high energy efficiency and low cost.
R-1234yf HFO-1234yf	$C_3H_2F_4$	2,3,3,3-Tetrafluoropropene		<1		Less performance but also less flammable than R-290.[57] GM announced that it would start using "hydro-fluoro olefin", HFO-1234yf, in all of its brands by 2013.[63]

R-744	CO_2	Carbon dioxide	1	1	In use	Was used as a refrigerant prior to the discovery of CFCs (this was also the case for propane)[4] and now having a renaissance due to it being non-ozone depleting, non-toxic and non-flammable. It may become the working fluid of choice to replace current HFCs in cars, supermarkets, and heat pumps. Coca-Cola has fielded CO_2-based beverage coolers and the U.S. Army is considering CO_2 refrigeration.[64][65] Due to the need to operate at pressures of up to 130 bars (1,900 psi; 13,000 kPa), CO_2 systems require highly resistant components, however these have already been developed for mass production in many sectors.

Most used

[edit]

Code	Chemical	Name	Global warming potential 20yr[59]	GWP 100yr [59]	Status	Commentary
R-32 HFC-32	CH_2F_2	Difluoromethane	2430	677	Widely used	Promoted as climate-friendly substitute for R-134a and R-410A, but still with high climate impact. Has excellent heat transfer and pressure drop performance, both in condensation and vaporisation.[66] It has an atmospheric lifetime of nearly 5 years.[67] Currently used in residential and commercial air-conditioners and heat pumps.

R-134a HFC-134a	CH_2FCF_3	1,1,1,2-Tetrafluoroethane	3790	1550	Widely used	Most used in 2020 for hydronic heat pumps in Europe and the United States in spite of high GWP.[58] Commonly used in automotive air conditioners prior to phase out which began in 2012.
R-410A		50% R-32 / 50% R-125 (pentafluoroethane)	Between 2430 (R-32) and 6350 (R-125)	> 677	Widely Used	Most used in split heat pumps / AC by 2018. Almost 100% share in the USA.[58] Being phased out in the US starting in 2022.[68][69]

Banned / Phased out

[edit]

Code	Chemical	Name	Global warming potential 20yr[59]	GWP 100yr [59]	Status	Commentary
R-11 CFC-11	CCl_3F	Trichlorofluoromethane	6900	4660	Banned	Production was banne in developed countrie by Montreal Protocol 1996

R-12 CFC-12	CCl_2F_2	Dichlorodifluoromethane	10800	10200	Banned	Also known as Freon, a widely used chlorofluorocarbon halomethane (CFC). Production was banne in developed countrie by Montreal Protocol 1996, and in developin countries (article 5 countries) in 2010.[70]
R-22 HCFC-22	$CHClF_2$	Chlorodifluoromethane	5280	1760	Being phased out	A widely used hydrochlorofluorocarb (HCFC) and powerful greenhouse gas with a GWP equal to 1810. Worldwide productior R-22 in 2008 was abo 800 Gg per year, up from about 450 Gg pe year in 1998. R-438A (MO-99) is a R-22 replacement.[71]

R-123 HCFC-123	$CHCl_2CF_3$	2,2-Dichloro-1,1,1-trifluoroethane	292	79	US phase-out	Used in large tonnage centrifugal chiller applications. All U.S. production and impor of virgin HCFCs will be phased out by 2030, w limited exceptions.[72 R-123 refrigerant was used to retrofit some chiller that used R-11 refrigerant Trichlorofluoromethar The production of R-1 was banned in developed countries b Montreal Protocol in 1996.[73]

Other

[edit]

Code	Chemical	Name	Global warming potential 20yr[59]	GWP 100yr [59]	Commentary
R-152a HFC-152a	CH_3CHF_2	1,1-Difluoroethane	506	138	As a compressed air duster

R-407C	Mixture of difluoromethane and pentafluoroethane and 1,1,1,2-tetrafluoroethane	A mixture of R-32, R-125, and R-134a
R-454B	Difluoromethane and 2,3,3,3-Tetrafluoropropene	HFOs blend of refrigerants Difluoromethane (R-32) and 2,3,3,3-Tetrafluoropropene (R-1234yf).[74][75][76][77]
R-513A	An HFO/HFC blend (56% R-1234yf/44%R-134a)	May replace R-134a as an interim alternative[78]
R-514A	HFO-1336mzz-Z/trans-1,2-dichloroethylene (t-DCE)	An hydrofluoroolefin (HFO)-based refrigerant to replace R-123 in low pressure centrifugal chillers for commercial and industrial applications.[79][80]

Refrigerant reclamation and disposal

[edit]
Main article: Refrigerant reclamation

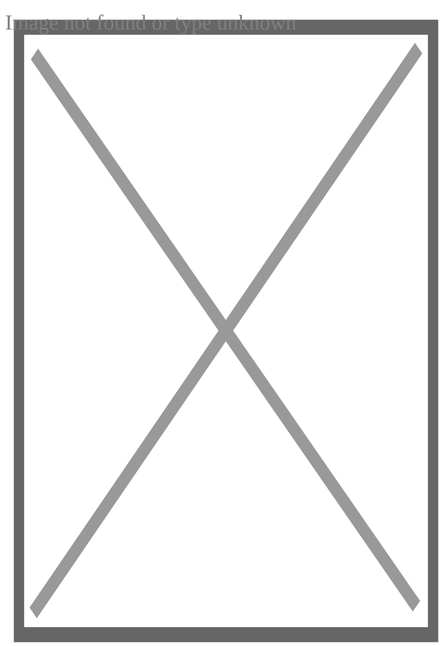
Coolant and refrigerants are found throughout the industrialized world, in homes, offices, and factories, in devices such as refrigerators, air conditioners, central air conditioning systems (HVAC), freezers, and dehumidifiers. When these units are serviced, there is a risk that refrigerant gas will be vented into the atmosphere either accidentally or intentionally, hence the creation of technician training and certification programs in order to ensure that the material is conserved and managed safely. Mistreatment of these gases has been shown to deplete the ozone layer and is suspected to contribute to global warming.[81]

With the exception of isobutane and propane (R600a, R441A and R290), ammonia and CO_2 under Section 608 of the United States' Clean Air Act it is illegal to knowingly release any refrigerants into the atmosphere.[82][83]

Refrigerant reclamation is the act of processing used refrigerant gas which has previously been used in some type of refrigeration loop such that it meets specifications for new refrigerant gas. In the United States, the Clean Air Act of 1990 requires that used refrigerant be processed by a certified reclaimer, which must be licensed by the United States Environmental Protection Agency (EPA), and the material must be recovered and delivered to the reclaimer by EPA-certified technicians.[84]

Classification of refrigerants

[edit]



R407C pressure-enthalpy diagram, isotherms between the two saturation lines

Main article: List of refrigerants

Refrigerants may be divided into three classes according to their manner of absorption or extraction of heat from the substances to be refrigerated:[*citation needed*]

- Class 1: This class includes refrigerants that cool by phase change (typically boiling), using the refrigerant's latent heat.
- Class 2: These refrigerants cool by temperature change or 'sensible heat', the quantity of heat being the specific heat capacity x the temperature change. They are air, calcium chloride brine, sodium chloride brine, alcohol, and similar nonfreezing solutions. The purpose of Class 2 refrigerants is to receive a reduction of temperature from Class 1 refrigerants and convey this lower temperature to the area to be cooled.
- Class 3: This group consists of solutions that contain absorbed vapors of liquefiable agents or refrigerating media. These solutions function by nature of their ability to carry liquefiable vapors, which produce a cooling effect by the absorption of their heat of solution. They can also be classified into many categories.

R numbering system

[edit]

The R- numbering system was developed by DuPont (which owned the Freon trademark), and systematically identifies the molecular structure of refrigerants made with a single halogenated hydrocarbon. ASHRAE has since set guidelines for the numbering system as follows:[85]

R-$X_1X_2X_3X_4$

- **X_1** = Number of unsaturated carbon-carbon bonds (omit if zero)
- **X_2** = Number of carbon atoms minus 1 (omit if zero)
- **X_3** = Number of hydrogen atoms plus 1

- X_4 = Number of fluorine atoms

Series

[edit]

- **R-xx** Methane Series
- **R-1xx** Ethane Series
- **R-2xx** Propane Series
- **R-4xx** Zeotropic blend
- **R-5xx** Azeotropic blend
- **R-6xx** Saturated hydrocarbons (except for propane which is R-290)
- **R-7xx** Inorganic Compounds with a molar mass < 100
- **R-7xxx** Inorganic Compounds with a molar mass ≥ 100

Ethane Derived Chains

[edit]

- **Number Only** Most symmetrical isomer
- **Lower Case Suffix (a, b, c, etc.)** indicates increasingly unsymmetrical isomers

Propane Derived Chains

[edit]

- **Number Only** If only one isomer exists; otherwise:
- **First lower case suffix (a-f):**
  - **a Suffix** Cl_2 central carbon substitution
  - **b Suffix** Cl, F central carbon substitution
  - **c Suffix** F_2 central carbon substitution
  - **d Suffix** Cl, H central carbon substitution
  - **e Suffix** F, H central carbon substitution
  - **f Suffix** H_2 central carbon substitution
- **2nd Lower Case Suffix (a, b, c, etc.)** Indicates increasingly unsymmetrical isomers

Propene derivatives

[edit]

- **First lower case suffix (x, y, z)**:
  - **x Suffix** Cl substitution on central atom
  - **y Suffix** F substitution on central atom
  - **z Suffix** H substitution on central atom
- **Second lower case suffix (a–f)**:
  - **a Suffix** $=CCl_2$ methylene substitution
  - **b Suffix** =CClF methylene substitution
  - **c Suffix** $=CF_2$ methylene substitution
  - **d Suffix** =CHCl methylene substitution
  - **e Suffix** =CHF methylene substitution
  - **f Suffix** $=CH_2$ methylene substitution

Blends

[edit]

- **Upper Case Suffix (A, B, C, etc.)** Same blend with different compositions of refrigerants

Miscellaneous

[edit]

- **R-Cxxx** Cyclic compound
- **R-Exxx** Ether group is present
- **R-CExxx** Cyclic compound with an ether group
- **R-4xx/5xx + Upper Case Suffix (A, B, C, etc.)** Same blend with different composition of refrigerants
- **R-6xx + Lower Case Letter** Indicates increasingly unsymmetrical isomers
- **7xx/7xxx + Upper Case Letter** Same molar mass, different compound

- **R-xxxxB#** Bromine is present with the number after B indicating how many bromine atoms
- **R-xxxxI#** Iodine is present with the number after I indicating how many iodine atoms
- **R-xxx(E)** Trans Molecule
- **R-xxx(Z)** Cis Molecule

For example, R-134a has 2 carbon atoms, 2 hydrogen atoms, and 4 fluorine atoms, an empirical formula of tetrafluoroethane. The "a" suffix indicates that the isomer is unbalanced by one atom, giving 1,1,1,2-Tetrafluoroethane. R-134 (without the "a" suffix) would have a molecular structure of 1,1,2,2-Tetrafluoroethane.

The same numbers are used with an R- prefix for generic refrigerants, with a "Propellant" prefix (e.g., "Propellant 12") for the same chemical used as a propellant for an aerosol spray, and with trade names for the compounds, such as "**Freon** 12". Recently, a practice of using abbreviations HFC- for hydrofluorocarbons, CFC- for chlorofluorocarbons, and HCFC- for hydrochlorofluorocarbons has arisen, because of the regulatory differences among these groups.[*citation needed*]

Refrigerant safety

[edit]

ASHRAE Standard 34, *Designation and Safety Classification of Refrigerants*, assigns safety classifications to refrigerants based upon toxicity and flammability.

Using safety information provided by producers, ASHRAE assigns a capital letter to indicate toxicity and a number to indicate flammability. The letter "A" is the least toxic and the number 1 is the least flammable.[86]

See also

[edit]

- Brine (Refrigerant)
- Section 608

- List of Refrigerants

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External links

[edit]

- US Environmental Protection Agency page on the GWPs of various substances
- Green Cooling Initiative on alternative natural refrigerants cooling technologies
- International Institute of Refrigeration Archived 2018-09-25 at the Wayback Machine

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Heating, ventilation, and air conditioning

Fundamental concepts

- Air changes per hour
- Bake-out
- Building envelope
- Convection
- Dilution
- Domestic energy consumption
- Enthalpy
- Fluid dynamics
- Gas compressor
- Heat pump and refrigeration cycle
- Heat transfer
- Humidity
- Infiltration
- Latent heat
- Noise control
- Outgassing
- Particulates
- Psychrometrics
- Sensible heat
- Stack effect
- Thermal comfort
- Thermal destratification
- Thermal mass
- Thermodynamics
- Vapour pressure of water

Technology

- Absorption-compression heat pump
- Absorption refrigerator
- Air barrier
- Air conditioning
- Antifreeze
- Automobile air conditioning
- Autonomous building
- Building insulation materials
- Central heating
- Central solar heating
- Chilled beam
- Chilled water
- Constant air volume (CAV)
- Coolant
- Cross ventilation
- Dedicated outdoor air system (DOAS)
- Deep water source cooling
- Demand controlled ventilation (DCV)
- Displacement ventilation
- District cooling
- District heating
- Electric heating
- Energy recovery ventilation (ERV)
- Firestop
- Forced-air
- Forced-air gas
- Free cooling
- Heat recovery ventilation (HRV)
- Hybrid heat
- Hydronics
- Ice storage air conditioning
- Kitchen ventilation
- Mixed-mode ventilation
- Microgeneration
- Passive cooling
- Passive daytime radiative cooling

- Air conditioner inverter
- Air door
- Air filter
- Air handler
- Air ionizer
- Air-mixing plenum
- Air purifier
- Air source heat pump
- Attic fan
- Automatic balancing valve
- Back boiler
- Barrier pipe
- Blast damper
- Boiler
- Centrifugal fan
- Ceramic heater
- Chiller
- Condensate pump
- Condenser
- Condensing boiler
- Convection heater
- Compressor
- Cooling tower
- Damper
- Dehumidifier
- Duct
- Economizer
- Electrostatic precipitator
- Evaporative cooler
- Evaporator
- Exhaust hood
- Expansion tank
- Fan
- Fan coil unit
- Fan filter unit
- Fan heater

Measurement and control	◦ Air flow meter ◦ Aquastat ◦ BACnet ◦ Blower door ◦ Building automation ◦ Carbon dioxide sensor ◦ Clean air delivery rate (CADR) ◦ Control valve ◦ Gas detector ◦ Home energy monitor ◦ Humidistat ◦ HVAC control system ◦ Infrared thermometer ◦ Intelligent buildings ◦ LonWorks ◦ Minimum efficiency reporting value (MERV) ◦ Normal temperature and pressure (NTP) ◦ OpenTherm ◦ Programmable communicating thermostat ◦ Programmable thermostat ◦ Psychrometrics ◦ Room temperature ◦ Smart thermostat ◦ Standard temperature and pressure (STP) ◦ Thermographic camera ◦ Thermostat ◦ Thermostatic radiator valve

Professions, trades, and services	◦ Architectural acoustics ◦ Architectural engineering ◦ Architectural technologist ◦ Building services engineering ◦ Building information modeling (BIM) ◦ Deep energy retrofit ◦ Duct cleaning ◦ Duct leakage testing ◦ Environmental engineering ◦ Hydronic balancing ◦ Kitchen exhaust cleaning ◦ Mechanical engineering ◦ Mechanical, electrical, and plumbing ◦ Mold growth, assessment, and remediation ◦ Refrigerant reclamation ◦ Testing, adjusting, balancing
Industry organizations	◦ AHRI ◦ AMCA ◦ ASHRAE ◦ ASTM International ◦ BRE ◦ BSRIA ◦ CIBSE ◦ Institute of Refrigeration ◦ IIR ◦ LEED ◦ SMACNA ◦ UMC
Health and safety	◦ Indoor air quality (IAQ) ◦ Passive smoking ◦ Sick building syndrome (SBS) ◦ Volatile organic compound (VOC)

See also

- ASHRAE Handbook
- Building science
- Fireproofing
- Glossary of HVAC terms
- Warm Spaces
- World Refrigeration Day
- Template:Home automation
- Template:Solar energy

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Things To Do in Tulsa County

Photo

Route 66 Historical Village

4.4 (718)

Photo

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Tulsa Zoo

4.5 (10481)

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Center of the Universe

4.4 (4471)

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Tulsa Air and Space Museum & Planetarium

4.3 (419)

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Gathering Place

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Woodward Park and Gardens

4.7 (2580)

Driving Directions in Tulsa County

Driving Directions From Best Western Airport to Durham Supply Inc

Driving Directions From Brookhaven Hospitales to Durham Supply Inc

Driving Directions From Dollar General to Durham Supply Inc

Driving Directions From Subway to Durham Supply Inc

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Driving Directions From Bob Dylan Center to Durham Supply Inc

Driving Directions From Woodward Park and Gardens to Durham Supply Inc

Driving Directions From The Blue Dome to Durham Supply Inc

Driving Directions From Gathering Place to Durham Supply Inc

Driving Directions From Tulsa Zoo to Durham Supply Inc

Driving Directions From Oxley Nature Center to Durham Supply Inc

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Reviews for Durham Supply Inc

Durham Supply Inc

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Ty Spears

(5)

Bought a door/storm door combo. Turns out it was the wrong size. They swapped it out, quick and easy no problems. Very helpful in explaining the size differences from standard door sizes.

Durham Supply Inc

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Gerald Clifford Brewster

(5)

We will see, the storm door I bought says on the tag it's 36x80, but it's 34x80. If they return it.......they had no problems returning it. And it was no fault of there's, you measure a mobile home door different than a standard door!

Durham Supply Inc

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Ethel Schiller

(5)

This place is really neat, if they don't have it they can order it from another of their stores and have it there overnight in most cases. Even hard to find items for a trailer! I definitely recommend this place to everyone! O and the prices is awesome too!

Durham Supply Inc

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Dennis Champion

(5)

Durham supply and Royal supply seems to find the most helpful and friendly people to work in their stores, we are based out of Kansas City out here for a few remodels and these guys treated us like we've gone there for years.

Durham Supply Inc

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B Mann

(5)

I was in need of some items for a double wide that I am remodeling and this place is the only place in town that had what I needed (I didn't even try the other rude place)while I was there I learned the other place that was in Tulsa that also sold mobile home supplies went out of business (no wonder the last time I was in there they were VERY RUDE and high priced) I like the way Dunham does business they answered all my questions and got me the supplies I needed, very friendly, I will be back to purchase the rest of my items when the time comes.

Checking Air Pressure to Reduce Allergens in Mobile Home Interiors**View GBP**

Check our other pages :

- **Inspecting Vent Connections for Improved Air Quality**
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- **Preparing Mobile Home HVAC Units for Intense Summer Heat**
- **Minimizing Drafts Through Sealed Mobile Home Duct Systems**
- **Handling Power Outages in Mobile Home Heating Systems**

Frequently Asked Questions

How does checking air pressure in a mobile home HVAC system help reduce allergens?

Checking and maintaining proper air pressure ensures efficient airflow and filtration. Balanced pressure prevents the infiltration of outdoor allergens, while effective airflow supports filters in capturing indoor allergens like dust and pollen.

What tools are needed to check air pressure in a mobile homes HVAC system?

To check air pressure, you need a manometer or a pressure gauge designed for HVAC systems. These tools measure the static pressure within the ducts, helping identify imbalances that may contribute to allergen circulation.

How often should air pressure be checked to maintain low allergen levels in a mobile home?

Its advisable to check the air pressure every 6-12 months or whenever there is a noticeable change in air quality or HVAC performance. Regular checks help ensure optimal system operation and minimize allergen presence by maintaining proper ventilation and filtration efficiency.

Royal Supply Inc

Phone : +16362969959

City : Oklahoma City

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