



Steel Houses: Sustainability and Energy Efficiency in Europe

Haven Urban Dwell is proud to present the benefits of steel for construction in Europe. Steel provides a Unmatched durability and energy efficiency, as well as being a versatile and modular material that adapts This document explores in detail the materials, techniques and and the systems used in the creation of eco-friendly, high-end steel homes.

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Environmental Responsibility

Steel houses are environmentally friendly, using recyclable materials and minimizing waste during construction. Their energy-efficient design reduces reliance on fossil fuels, contributing to a greener footprint.

Energy Efficiency

Steel houses are designed to maximize energy efficiency, incorporating features like high-performance insulation, energy-efficient HVAC systems, and solar panels. They reduce energy consumption and lower utility bills.

Durability and Longevity

Steel houses are built to last, with strong and durable materials that resist corrosion and weathering. Their longevity reduces the need for frequent repairs and replacements, promoting sustainability.



Manufacturing Processes of Steel Products

1

Iron Ore Mining

The process begins with mining iron ore, a natural resource rich in iron, which is then transported to steel mills for processing.

2

Iron Ore Processing

Iron ore is crushed, ground, and treated to remove impurities, resulting in a concentrated iron material known as iron pellets or sinter.

3

Smelting and Refining

Iron pellets are melted in a blast furnace, where they are combined with coke and limestone to produce molten iron. This is then further refined to remove impurities and create steel.

4

Steel Shaping and Finishing

Molten steel is poured into molds to form ingots, which are then rolled and shaped into various profiles, like beams, sheets, and pipes. These steel products are then finished, often with coatings or treatments, to enhance their properties.

Materials and Techniques of Construction

Haven Urban Dwell steel homes combine materials of high quality construction to advanced techniques to offer a optimal performance. Galvanized steel and stainless steel are used for their corrosion resistance and exceptional durability

Materials and Techniques of Construction

Interior Walls

Interior walls are designed for comfort and acoustics. They are constructed with various materials, including plasterboard, wood fiber, plywood, and paneling. Acoustic panels are also used to improve sound absorption.

Exterior Walls

Exterior walls prioritize durability and insulation. Steel cladding, coated fibercement boards, metal cladding, and sandwich panels provide protection and optimal insulation.

Floor

Floor finishes are durable and easy to maintain. Options include vinyl, ceramic or porcelain tiles, laminated parquet, polished concrete, and epoxy cladding.

Ceilings

Ceilings are built with various systems, including metal suspended ceilings, acoustic panels, plaster, mineral fiber, and wood. They offer aesthetic appeal and optimal performance.

HVAC Systems

Air Conditioning

Steel houses are equipped with energy-efficient air conditioning systems that provide optimal cooling while minimizing energy consumption. These systems are often integrated into the building's design for seamless functionality.

Ventilation

Controlled mechanical ventilation (CMV) systems ensure a constant flow of fresh air and excellent indoor air quality. These systems help regulate humidity levels and remove pollutants, promoting a healthy living environment.

Heating

For heating, a hydraulic floor heating system is often used in bathrooms, providing a uniform heat distribution. The rest of the house can be equipped with electric heaters, radiant panel heaters, or other efficient heating solutions.



Insulation and Energy Performance

Walls

Steel houses feature advanced insulation solutions, ensuring energy efficiency and comfort. A wide range of high-performance materials are utilized, including mineral wool, polyurethane foam, polystyrene expanded, polyisocyanurate, and glass wool. These materials effectively reduce heat loss and maintain a comfortable indoor temperature.

Floor

The floors of steel houses are insulated with various materials, including extruded polystyrene panels, hard foam, rock wool, expanded cork, and cellulose. These materials are selected for their excellent thermal performance, contributing to energy efficiency and comfort.

Ceiling

Ceiling insulation plays a crucial role in minimizing heat loss and ensuring excellent acoustic performance. A variety of materials are used, including glass wool, fiber glass panels, cellulose, expanded polystyrene, and polyurethane, offering exceptional thermal efficiency and sound absorption.

Roof

The roof of a steel house requires careful insulation to prevent heat loss and maintain energy efficiency. Various materials are employed, including polyurethane membranes, extruded polystyrene panels, reflective insulation, rock wool, and polyisocyanurate, ensuring optimal thermal performance.



Insulation and Energy Performance

Wall	Insulation Materials	R Factor
Walls	Mineral wool, polyurethane foam, polystyrene expanded, polyisocyanurate, glass wool	3.0-3.5, 6.0-7.0, 4.0-5.0, 6.0-7.0, 3.0-3.5
Floor	Extruded polystyrene panels, hard foam, rock wool, cork expanded, cellulose	4.0-5.0, 3.0-4.0, 3.0-4.0, 3.0-4.0, 3.0-4.0
Ceiling	Glass wool, glass fiber panels, cellulose, expanded polystyrene, polyurethane	3.0-3.5, 3.0-3.5, 3.0-4.0, 4.0-5.0, 6.0-7.0
Roof	Polyurethane membranes, extruded polystyrene panels, reflective insulation, rock wool, polyisocyanurate	6.0-7.0, 4.0-5.0, 3.0-4.0, 3.0-4.0, 6.0-7.0

Windows and Glazing

Double Glazing

Double glazing, with an air or gas-filled space, significantly enhances thermal and acoustic insulation while reducing condensation. It offers an R-value between 2.0 and 3.0.

Triple Glazing

Triple glazing, boasting an R-value from 3.0 to 5.0, provides exceptional thermal and acoustic insulation, minimizing heat loss remarkably. It consists of three panes of glass.

Low-E Glass

Low-E glass, treated with a reflective coating, enhances the performance of double or triple glazing systems, reducing heat gain in summer and loss in winter. It reflects infrared radiation.

Other Types of Glazing

Tempered, laminated, and other advanced glass technologies are also employed for safety, impact resistance, and protection against noise and UV rays.

Windows and Accessories



Opening Windows

Steel houses feature a variety of window types, including casement, sliding, and tilt-and-turn, maximizing natural light and ventilation.



Solar Screens and Blinds

Integrated solar screens and blinds control solar gain, reducing overheating and enhancing energy efficiency.



Benefits

These innovative window and insulation solutions reduce cooling costs while offering exceptional comfort and a connection to the outdoors.

European Standards and Regulations

Haven Urban Dwell steel houses adhere to strict European standards and regulations, guaranteeing safety, durability, and environmental performance.

These homes prioritize sustainability, aligning with ambitious sustainable development goals.

Beyond European standards, Haven houses feature advanced security systems, such as alarms and surveillance cameras, ensuring occupant safety.



STANDARDS

European standards

EN 10025: Specifies the technical delivery conditions for flat and long products made of structural steel.

EN 1090: Standard for the execution of steel and aluminium structures, covering compliance requirements welding and assembly standards.

EN 1993 (Eurocode 3): Set of European standards for the design of steel structures in the construction. This includes specific parts on sizing rules for steel structures subject to static and dynamic loads.

NF DTU (Unified Technical Document): The DTU are documents that define the rules of art and implementation techniques in the field of construction in France. They are developed by the Centre Scientific and Technical Building (CSTB) and are widely used to ensure the quality and durability of works.

HQE (High Environmental Quality): The HQE is a French approach certified by organizations such as Certivéa. It aims to integrate environmental criteria into the construction and management of buildings for reduce their impact on the environment while improving occupant comfort.

RT 2012 and RE 2020 (Thermal Regulation): The RT 2012 is a French regulation that sets Energy performance requirements for new buildings.

QFR 2020 (future regulations) will strengthen These requirements with an increased focus on energy efficiency and the carbon footprint of buildings.

US Standards

AISC 360: Specifies design, analysis and construction requirements for steel structures.

AISC 341: Standard for seismic design of steel structures, detailing seismic resistance criteria and performance of steel seismic resistance systems.

AWS (American Welding Society): Sets standards for welding processes used in manufacturing and steel construction, ensuring the quality and safety of the welds.

LEED (Leadership in Energy and Environmental Design): LEED is a certification system developed by the US Green Building Council (USGBC) to assess and recognize the environmental performance of buildings. It is widely used in the US and other countries to encourage sustainable construction.

ANSI (American National Standards Institute): The ANSI is an American organization that coordinates and establishes national standards for various sectors, including construction. Its standards are adopted to ensure safety, quality and compatibility of products and services.

ASTM (American Society for Testing and Materials): ASTM develops and publishes technical standards for various materials, products, systems and services in the U.S. These standards are used to ensure quality, safety, safety and compliance of construction products and other industries.

International Building Code (IBC): The IBC is an international building code adopted by many states . It establishes minimum requirements for the safety, public health and general well-being of building occupants by covering aspects such as structure, electricity, ventilation and safety fire.

Smart Home Integration



Smart Home Hub

A centralized home automation hub seamlessly integrates and controls all connected devices for intuitive control and energy efficiency optimization. Using Alexa, Google or Apple home



Mobile App Control

A dedicated mobile app allows occupants to remotely monitor and control all connected devices, from lighting to appliances, for optimal comfort and security.



Smart Lighting

Connected LED bulbs and smart switches enable personalized lighting control, scheduling, and remote operation, enhancing comfort and energy efficiency.

Details of Smart Tools Security System

An advanced smart security system integrates motion sensors, surveillance cameras, and a connected alarm system, offering enhanced protection against intrusions. It allows constant monitoring of the house, even remotely.

Energy Management

With the energy management feature, residents can monitor their energy consumption in real time, identify energy-hungry devices, and take steps to reduce their environmental footprint.

Temperature Control

A smart thermostat allows precise temperature control, automatically adjusting settings based on the occupants’ living habits. This provides optimal comfort while reducing energy costs.

Integration of Smart Home Features

Central Control Systems

- Home Automation Hub
- Mobile App for Centralized Control

Smart Lighting

- Connected LED Bulbs
- Smart Switches

Smart Thermostat

- Connected Thermostat
- Temperature Sensors

Security and Surveillance

- Smart Security Cameras
- Motion and Door Sensors
- Smart Locks
- Gas and Water Leak Detectors

Sound and Video Systems

- Smart Speakers
- Connected Entertainment Systems

Energy Management

- Smart Plugs and Power Strips
- Energy Sensors

Shade and Curtain Management

- Automated Shades and Curtains

Connected Kitchen Equipment

- Smart Home Appliances

Water Management

- Water Leak Detectors
- Smart Faucets

Integration with Voice Assistants

- Voice Assistants (Alexa, Google Assistant, Siri)

Environmental Sensors

- Air Quality Sensors
- Humidity Sensors

Automation Management Systems

- Automated Programming and Scenarios

Longevity and Durability of Steel

1

Corrosion Resistance

Steel used in construction is treated with coatings and galvanization to prevent corrosion and rusting, ensuring long-lasting durability.

2

Weather Resistance

Steel is strong and resistant to weathering, including rain, snow, and wind. It maintains its structural integrity and appearance over time.

3

Fire Resistance

Steel is a non-combustible material, providing a high level of fire resistance. It can withstand high temperatures without collapsing, ensuring the safety of occupants.

4

Seismic Resistance

Steel framing is flexible and adaptable, making it resistant to seismic activity. It can withstand earthquakes and other natural disasters without significant damage.



Steel Houses: A Sustainable Future



Energy Efficiency

Steel houses contribute to reducing energy consumption and carbon emissions, promoting a sustainable lifestyle.



Environmental Responsibility

Steel houses minimize their environmental impact, contributing to a healthier and more sustainable planet.



Recyclable Materials

Steel is a highly recyclable material, minimizing waste and promoting a circular economy.



Comfortable Living

Steel houses provide a comfortable and healthy living environment, thanks to their energy efficiency and design features.



Conclusion and Future Outlook

Haven Urban Dwell's steel houses represent the future of residential construction in Europe. By utilizing innovative materials, cutting-edge techniques, and high-performance systems, these homes offer unmatched durability, energy efficiency, and comfort. With a steadfast commitment to innovation and sustainability, Haven Urban Dwell is establishing itself as a leading force in creating eco-friendly and high-quality housing.

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