

Remotely monitored living comfort in Espoo's first wooden apartment building



Uponor involvement

- ✓ Uponor floor heating system, wired Uponor Smatrix Base PRO control system

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The water-circulating underfloor heating system, integrated into the building automation system, ensures living comfort and energy efficiency in Espoo's first wooden apartment building, Tuuliniitty 3, which was completed in January 2020.

Upon completion, the ARA rental building at Tuuliniitty 3 was the first wooden apartment building not only for the City of Espoo but also for the developer, Asuntosäätiö. Located next to the metro station in the center of Tapiola, the building has also been a pioneer in that, in accordance with zoning regulations, it is the city's first apartment building without parking spaces. The six-story building was designed as an architectural ensemble with the 13-story Hoas student housing building, which was completed on the same site in the spring of 2021, and the wooden apartment buildings are connected to each other by an outdoor storage area.

The construction of Tuuliniitty 3 utilized factory-manufactured wooden intermediate floor and wall elements, which were hoisted into place on-site while protected from the weather. The ground floor features concrete with a board-form finish, familiar from the old Tapiola neighborhood. Architect Jukka Turtiainen, who served as the lead designer for Tuuliniitty, explains that he also incorporated references to the Tapiola apartment buildings of the 1950s and 1960s into the building's facade. This is evident, for example, in the proportions of the facade and the building's windows.

Wood has been prominently used in the facade cladding and balcony structures. The wooden exterior doors and a relief wall composed of wooden planks near the entrances also highlight the use of wood in the construction.

The building contains 42 rent-subsidized apartments with balconies, ranging from 30-square-meter studios to 85-square-meter family apartments. Shared facilities include a building sauna, laundry room, drying room, and community space.

Draft-free and quiet living comfort

The apartments in the building, which attracted hundreds of applicants, are cozy and modern with balconies and floor-to-ceiling windows. Living comfort in all apartments is also ensured by water-circulating floor heating, which has rapidly become the standard method of heat distribution in apartment buildings in recent years.

– In wooden apartment buildings, floor heating is certainly the most commonly used method of heat distribution, and it is also becoming increasingly common in concrete apartment buildings. In addition to living comfort, one reason is that the system

hidden beneath the floor allows for more flexibility, for example, in window sizes,” notes Vesa-Pekka Juurtola, CEO of LVI-Vireli, the company responsible for the HVAC contract and its design.

Utilizing a large surface area for heat distribution and providing even, draft-free heat, underfloor heating is an energy- and cost-efficient solution suitable for use with all known heating methods. Thanks to the large floor area, the spaces can be heated at a low supply water temperature, allowing for the efficient use of geothermal heat—and, as in Tuuliniitty, district heating.

Water-circulating floor heating is also a silent solution, making it ideally suited for wooden apartment buildings, where special attention must be paid to sound insulation anyway due to the lightweight nature of the structures.

– To ensure both underfloor heating and sound insulation, a slab made of earth-moist concrete was poured into the building’s intermediate floors. Juurtola explains that Uponor was already a familiar partner, which influenced the choice this time as well.

– Especially in demanding projects, a partner proven to be reliable and of high quality is important. Uponor was responsible for the design and sizing of the underfloor heating system, as well as its programming, controls, and installation.

The installation of the underfloor heating piping utilized a fastening method developed by LVI-Vireli in a previous wooden apartment building project, in which the pipes are fastened directly to the plywood sheet using a staple gun.

Easy integration with building automation

The building’s underfloor heating is controlled by the wired Uponor Smatrix Base PRO control system, which can be easily integrated into building automation systems via either a KNX or Modbus RTU interface. Typically, the central units for all apartments in the building are connected to the home automation system, allowing data to be monitored remotely on a per-apartment basis. This helps avoid unnecessary service visits, among other things.

– At Tuuliniitty, temperature data is collected from five apartments; that is, the central unit of one apartment on each residential floor is connected to our building automation system via a Modbus RTU bus. Alarms are also transmitted to our system and, through it, directly to the maintenance company. An alarm is triggered, for example, when the minimum or maximum temperature limits set for the apartments are exceeded, explains Project Manager Matias Korkiakoski of Fidelix Oy, who was responsible for the building automation contract at the site.

Each room in the apartments has room thermostats that allow residents to adjust the heating in their homes on a room-by-room basis. However, temperatures cannot be adjusted from within the apartments to exceed or fall below predefined limits. This ensures not only living comfort but also the building’s energy efficiency.

According to Korkiakoski, the Smatrix Base PRO control system was easy to connect to the Modbus RTU interface.

– We had no prior experience with this, but the connection turned out to be effortless. Uponor was involved in the design and was responsible for the control system’s programming and configuration.

– A major advantage of the Modbus bus is the savings in cabling costs. Since the controllers can be daisy-chained together, only a single pair of cables is needed to transfer data between systems. Another strength of the Modbus protocol is its compatibility with nearly all building management systems, Korkiakoski notes.

In addition to heating, Fidelix’s building automation system is connected to, among other things, ventilation units, the domestic water network, lighting and locking systems, and water meters.

Source: Housing Foundation

Project Facts:

Location

Espoo, Finland

Completion

2020

Building Type

Multi family homes

Project Type

New building

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Especially for demanding projects, it is important to have a partner that has proven to be reliable and of high quality. Uponor was responsible for the design and sizing of the underfloor heating system, as well as its programming, adjustments, and installation.



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