

# School building complex in passive house standard with the help of securing anchors made of GRP

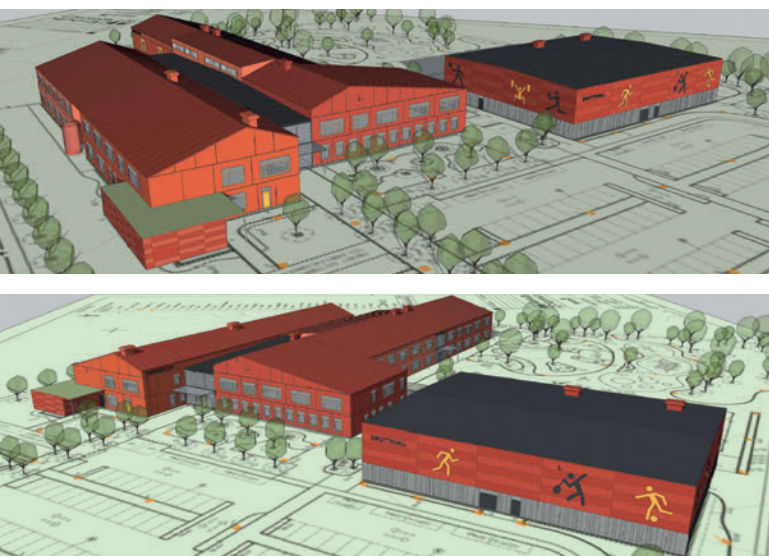
At the end of 2020, the Swedish precast concrete manufacturer Torps Byggelement AB was commissioned to produce the precast concrete elements (mainly sandwich construction) for the ambitious passive house project Paradise School in Älmhult, Sweden. The new school building is designed for forms 1 - 6, or 800 students. The building area amounts to approx. 8,500 m<sup>2</sup> of usable space plus a sports hall with over 3,000 m<sup>2</sup>. Since the building complex was to meet the passive standard, it was extremely important to make the building envelope as efficient as possible in terms of insulation, without having to compromise on the very vivid architecture in this respect. In its search for efficient construction methods and products, Torps Byggelement AB came across the ThermoPin® from BT innovation.

This securing anchor made of heat-conduction-resistant, glass-fibre reinforced plastic (GRP) connects the supporting shell to the curtain wall through the insulation layer very efficiently in terms of statics and energy. With the help of the ThermoPin, the support structure can be almost completely

thermally decoupled from the façade. According to the manufacturer, the use of the ThermoPin as a connecting element can achieve a reduction in the thermal conductivity coefficient or heat loss of the building envelope of up to 6.7% compared to conventional stainless-steel connection systems.

Following initial discussions between Torps Byggelement AB and BT's local partner D2B Byggprodukter AB in Landvetter, Sweden, the customer was convinced to try out and use the ThermoPin. For this purpose, B.T. innovation GmbH first calculated the optimum pin sizes and quantities. Based on and following a briefing by BT innovation's engineering department, Torps Byggelement AB produced the first elements. The production was accompanied by D2B Byggprodukter AB on site to ensure a smooth process.

After the first elements had been successfully manufactured, the delivery of the first precast concrete elements took place in the first two quarters of 2021. The assembly of these elements took 15 weeks. Completion of the entire building complex is scheduled for 2022.



Figures 1 and 2: Perspective view of the passive house project "Paradise School" in Älmhult, Sweden

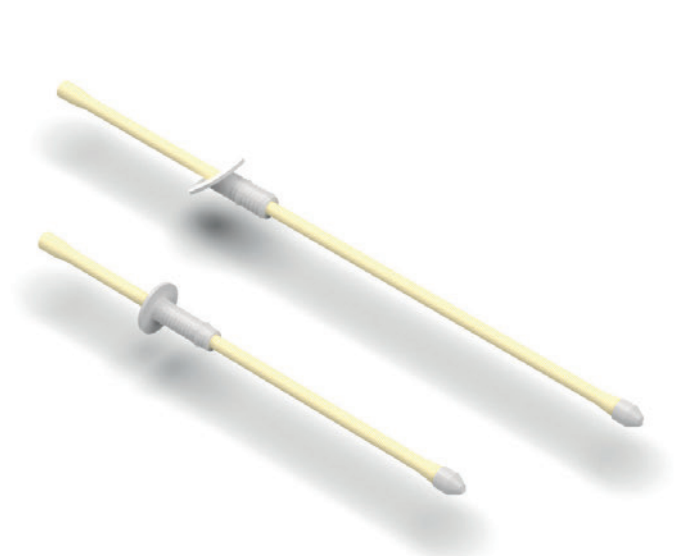


Figure 3: The ThermoPin is a securing anchor made of glass-fibre reinforced plastic (GRP) for sandwich walls and core-insulated double walls.

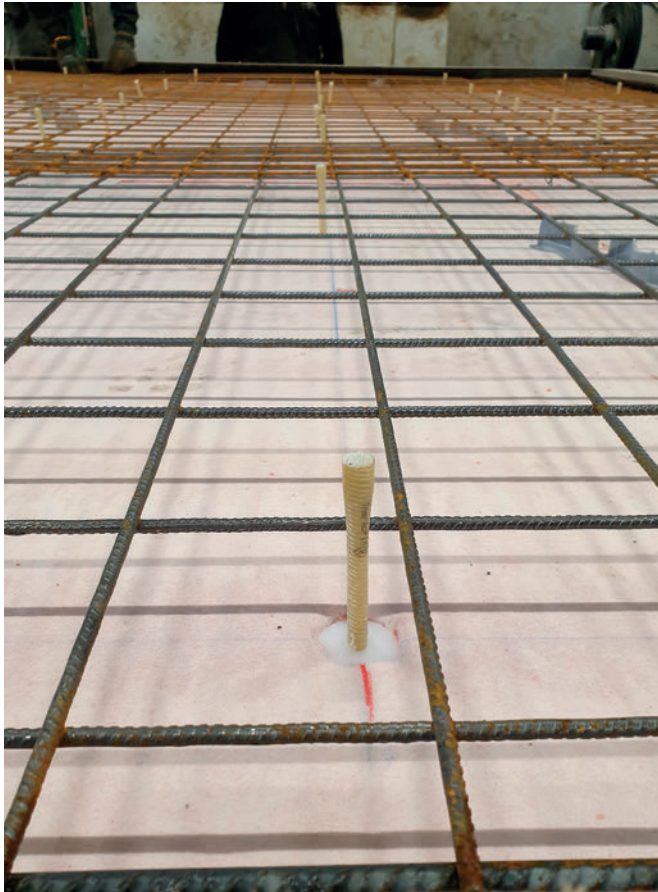


Figure 4: Installation of the ThermoPin from BT innovation in the concrete plant - horizontal bar



Figure 5: Installation of the ThermoPin in the concrete plant - diagonal bar

Besides the improvement in energy efficiency, the managing director of Torps Byggelement AB Henrik Engström and the production manager Morgan Karlsson concluded that the installation of the ThermoPin was in all respects much easier than the installation of traditional anchor systems. For example, much less insulation had to be cut, which also produced less waste. The installation of the ThermoPin does not require

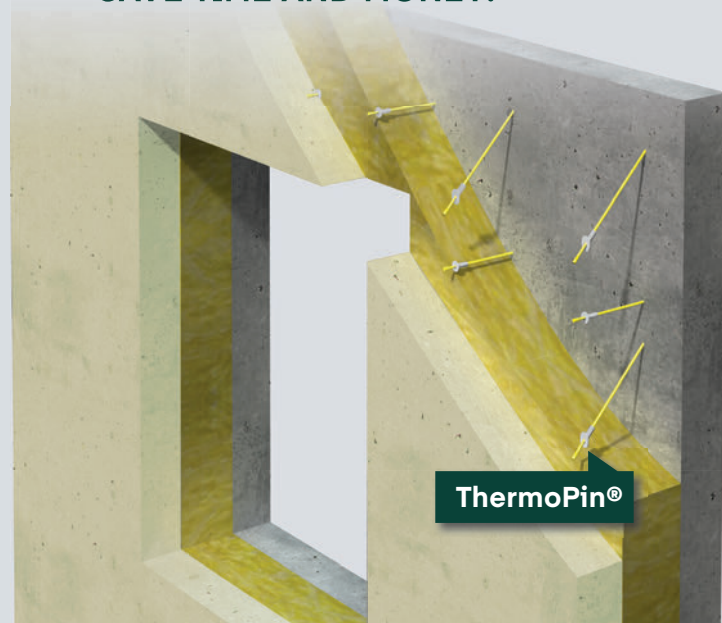
B.T. INNOVATION GMBH

## Connecting anchor for sandwich walls and core-insulated double walls

### ThermoPin®

- ✓ **improved heat storage** of the wall elements
- ✓ **slim construction** due to lower concrete cover
- ✓ simply attach the insulation to the fresh concrete, resulting in **increased productivity**
- ✓ **no aesthetic impairment** of the surfaces

**SAVE TIME AND MONEY!**



[www.bt-innovation.de](http://www.bt-innovation.de)





Figure 6: Finished sandwich wall



Figure 7: North façade of the Paradise School in Älmhult, Sweden



Figure 8: Follow-up project using the ThermoPin - housing project in Osby

any machines or tools. Torps Byggelement AB has found that by simplifying and speeding up the installation for the production of an average-sized element (approx. 20 m<sup>2</sup>), a total of 30 minutes is saved in production. With a total production effort for one element of approx. 20 working hours (2.5 employees x 8 hrs), the reduction in working time is therefore 2.5%.

For Torps Byggelement AB, this was an exciting project that broke new ground. Since then, Torps Byggelement AB has been convinced by ThermoPin and has already used the sys-

tem for two follow-up projects. Around 5,000 ThermoPins were used in the housing project in Osby. The 3rd project involves the construction of a warehouse in Jönköping, where 8,400 ThermoPins will be used. ■



Use of the ThermoPin  
briefly explained



## FURTHER INFORMATION



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