



Thermoplastic polyethylene (PE) panels can be deformed at temperatures starting from 110°C and easily welded together.



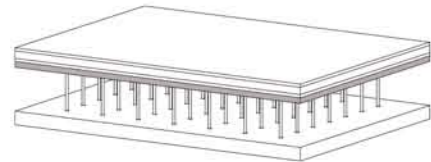
3-dimensional meshworks serve as reinforcement. Glass fibers in the top and bottom chord take over the tensile loads. Thermoplastic fibers separate the two glass fiber layers from each other. Monofilaments keep the meshwork in place.



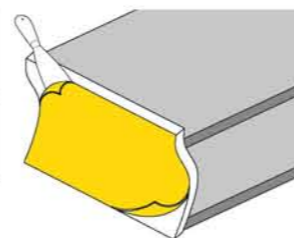
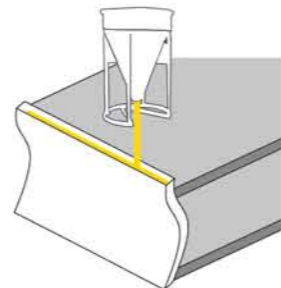
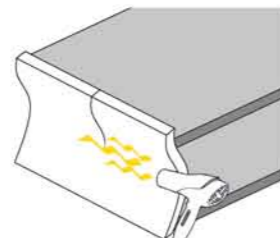
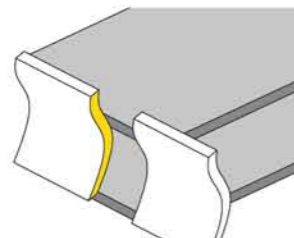
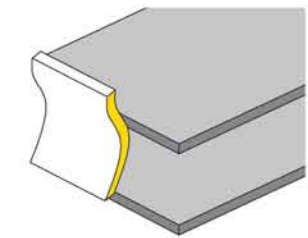
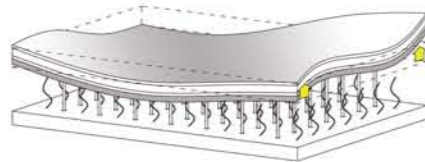
Mineral rock wool is used as the insulating layer in the center of the sandwich element.



Ultra High Performance Concrete (UHPC) with a grain size of only 0,1mm (maximum) and self compacting abilities assure a perfect surface and a strong concrete element.



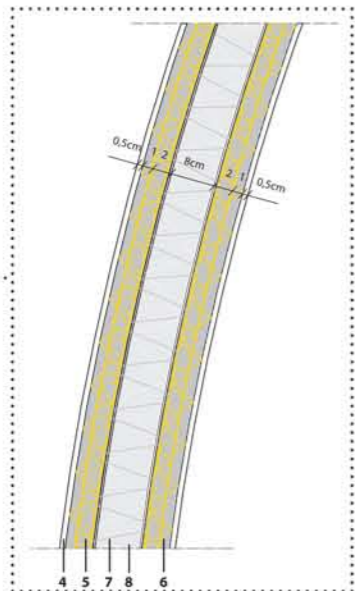
A **pneumatic formwork table** melts the **Thermoshape** sandwich element into the form needed and creates a replica of the form.



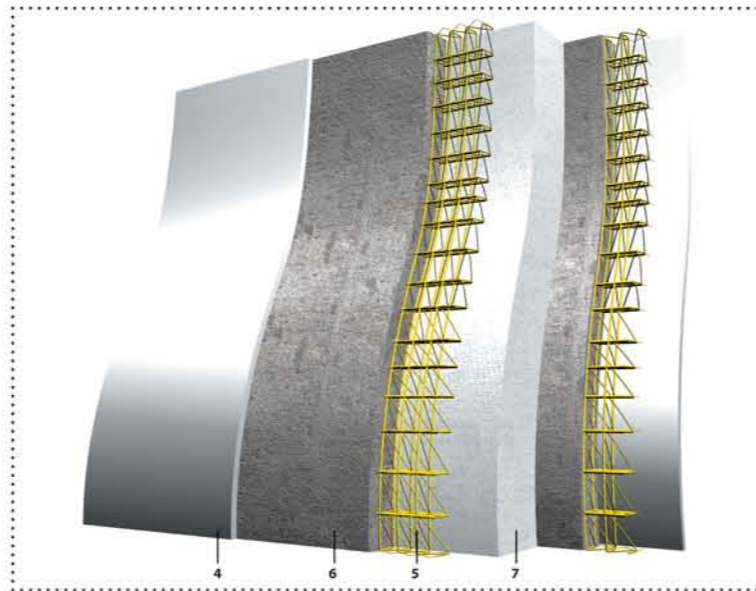
The element is prefabricated in a factory. Since the concrete is poured into the form later, light **Thermoshape** elements are easily transported to any construction site. Once on the site they are fixed at the right place, the parts are welded together so that the later appearance of the wall will not contain any joints. Now the **Thermoshape** elements are ready to be filled with concrete. Later, the thermoplastic layer is removed.



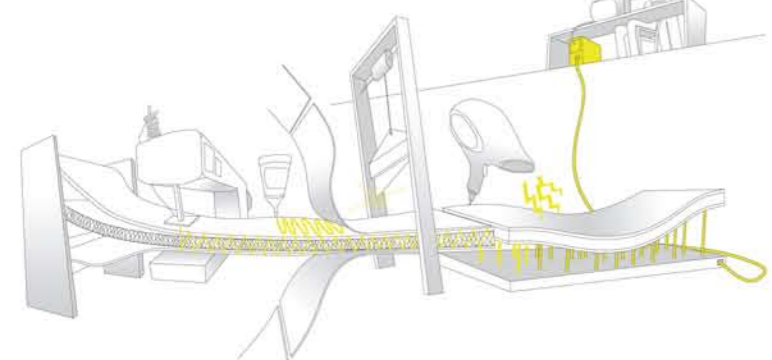
1 Thermoshape sandwich element filled with concrete (thermoplastic layer removed) and connected with the frame construction with façade anchors
2 shiny concrete surface
3 frame construction



4 Thermoplastic polyethylene (PE) panels
5 3-dimensional meshworks
6 Ultra High Performance Concrete
7 Mineral rock wool
8 Glass fibers



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schematic diagram of the manufacturing process



meshing the façade into prefabricable elements

CONCEPT

In today's architecture – when constructing with concrete – organic shapes are generated that ask for innovative solutions of formwork.

In combining different manufacturing processes, we created the concrete hybrid **Thermoshape**. Thus shiny concrete elements that are reinforced, jointless, and insulated can be produced.

The 3D-curved shapes that are mostly computer constructed are brought into their precise form with help of a pneumatic formwork table. Using the deep drawing manufacturing technology each thermoplastic sandwich element receives its form by melting it.

thermoshape sandwich elements

The **Thermoshape** sandwich element is put together with a core of mineral rock wool for insulation which is sewed together on both sides with a 3-dimensional meshwork as reinforcement. This complex fabric is composed of separating monofilaments to control the space between the surface and the reinforcing layer. Thermoplastic panels are cemented onto the sandwich structure.

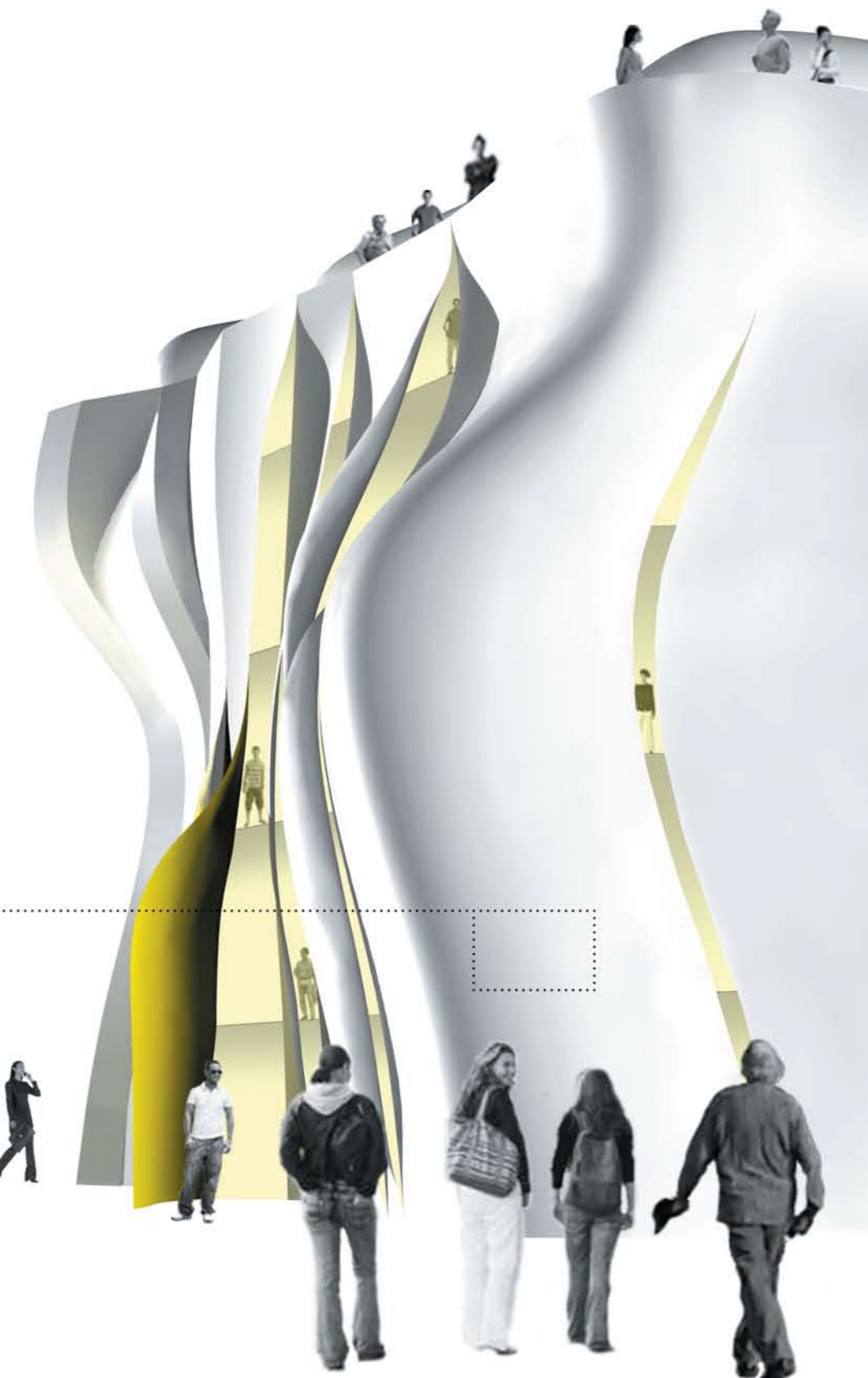
The innovative thermoplastic skin replaces the ordinary wooden formwork and makes it possible to shape the sandwich element in only a few minutes. It also guarantees a shiny and perfect surface of each concrete element.

After the **Thermoshape** sandwich elements are prefabricated, the light pieces can be easily positioned at the construction site. In the next production step one element is welded to the next one and the whole wall can be filled with concrete.

When the concrete has hardened, the thermoplastic skins have fulfilled their task. They are removed and will be recycled for the next element. The newly erected building now displays a shiny and jointless concrete façade.

VISION

A new type of façade can be realized. The **Thermoshape** elements are easily adaptable to existing buildings and give them a new appearance. This technique will simplify the construction of free forms and organic houses.



prototype model building