

Audi terminal – responsible architecture

The Audi terminal offers visionary architecture for the retail environment to give Audi a new, distinctive look in the major cities of the world. And, in terms of its construction method, this concept demonstrates **structural intelligence** and ecological responsibility.

By Bernhard Steinhilber



02-03 Pleasant, attractive lighting without thermal load is one of the goals within the climate and energy concept for the Audi terminal.

For Audi, high quality and distinctive architecture is not limited to spectacular buildings at corporate headquarters; it represents the brand at hundreds of locations worldwide. With its hangar concept, Audi already proved that even car dealerships can have a high level of architectural quality. With its new brand architecture, the company is now taking the next step and strengthening its presence at city centre locations. The Audi terminal presents the brand's continually growing model range in the world's major cities. The first locations are already open for business in cities such as Munich, Mexico City, Tokyo and Sydney and will be followed by over 350 more by the end of 2012.

In the conception of an urban car dealership and the development of the new corporate architecture, AUDI AG set itself the central tasks of responsible, efficient management of resources and the application of an ecologically intelligent, advanced construction method. These may have been demanding targets, but Munich architects Altmann Sattler Wappner and the experts in environmentally-friendly energy technology at specialist engineering company Transsolar in Stuttgart and Munich came up with an impressive solution.



"We defined the Audi terminal as a primarily vertical building with a facade focused far more on enclosed surfaces than on glass. For us, that meant throwing into question two characteristic architectural design principles normally associated with typical 'Autohaus' buildings. One step that we are taking with the Audi terminal, not least in respect of creating an operating environment that conserves resources."

Markus Altmann, Architect

Minimum footprint, maximum efficiency

The Audi terminal already has an optimised consumption profile in terms of footprint. This enables all the functional areas important to a vehicle dealership to be stacked one on top of the other on several floors. This also includes vehicle parking and used car retail space, which could be accommodated on the roof. The vertical orientation of the terminal is based around the restrictions of a city centre location. The importance of a minimal footprint is increasing during times of growing urban density and reduced available building space. The layout of the terminal is also kept very flexible in order to make the most of the geometry of each footprint. This facilitates maximum efficiency with minimum space usage. <<

04 One of the first Audi terminals was built in Geneva. Hundreds more will follow across the globe.

BA05: A new Audi terminal has also been built in Munich. The exterior facade is clad in perforated, folded aluminum profile.



Enclosed facade

The facade of the Audi terminal is clad largely with honeycomb-perforated, folded aluminum profile, accented only partially by large glazed areas. Glass openings are positioned at the corners of the building and follow the curved design of the showroom floor on each level. The high proportion of enclosed surface area on the facade, not typical for a car dealership, offers considerable benefits in terms of climate control and energy consumption.

"It was our objective to reduce the energy requirements of the Audi terminal to levels never before achieved by car dealerships. The interior climate quality of the building should, depending upon location, be handled largely or entirely without mechanical systems such as air conditioning. The ideal solution is the naturally ventilated building. The basic concept of the Audi terminal to abandon the fully-glazed approach typical to car dealerships not only serves its aesthetic quality—it also originates from the aspiration to combine brand requirements with ecological responsibility."

Markus Altmann, Architect

The climate and energy concept

The customer should feel at ease in the Audi terminal. Important factors are the right lighting and a consistently optimum temperature. The climate and energy concept developed for the Audi terminal by the engineers of Munich company Transsolar seeks to guarantee the optimum comfort for employees and visitors with the lowest possible consumption of primary energy.

The problem with conventional car dealerships is often that the large showroom areas with glass facades are heated from the outside by sunlight and from the inside by their lighting. Solar rays are absorbed primarily by the floor surface, which then radiates the heat into the interior air. The result is an uncomfortable indoor temperature. The reduction of the glazed surface area on the facade of the Audi terminal is already part of the solution. Further creative and innovative solutions for optimum temperature control within the building were required, without sacrificing the transparency of the building with large areas of screening or using energy-intensive air conditioning.

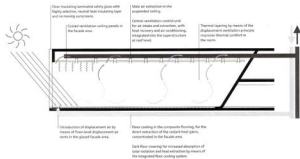
"Our climate concept incorporates an efficient system of cooling the structural elements in a way that traps the solar and interior heat before they enter the indoor temperature. This includes the use of cold radiation via floor cooling and a controlled ventilation system for temperature layering. Under particularly heavy demands, additional suspended chilled ceilings are used with integrated lighting units. The cooling medium could be cold groundwater, which can also be used in a reverse version of this system combined with a heat exchanger to provide floor heating."

Stefan Holst from Transsolar

Controlled absorption of solar radiation

The climate control solution devised by Transsolar engineers is as ingenious as it is simple. First, a specialist insulating glass with a selective heat protection layer reduces from the outset the solar heat transmitted through the glass surfaces. There is no need for any kind of movable screens and the clear, specialist glass guarantees maximum transparency.

Then comes a highly efficient cooling system. Similar to floor heating, a coolant flows through a pipe system arranged in loops within the floor surface. Ideally, the coolant should be cold groundwater from a spring, which can then be returned directly to the groundwater following its usage within the cooling system. Further proffered coolant options could include geothermal probes or geothermal absorbers.



For architect Professor Markus Altmann, the focus connecting the Audi terminal was on the conservation of resources. Stefan Holst (left), a partner at engineering firm Transsolar, developed the intelligent climate control concept.





The cooling coil system can also be installed in a suspended ceiling, where it radiates cold, as well as directly absorbing heat from the lighting units. Another decisive factor is the choice of colour. In order to make the floor cooling more efficient, a very dark floor covering is selected in order to absorb as much of the solar heat as possible. One further option is the additional application of structural element coating within the walls.

Temperature layering and winter operation

The effectiveness of the floor cooling is optimized by means of a displacement ventilation system for ventilation and for temperature layering. At a speed of only 20 centimetres per second, cold air flows into the showroom at floor level to form a pool of fresh air. Warm air rises and passes through the porous ceiling structure, where it enters the return air extraction system. Air supply and return is controlled from a central ventilation installation on the roof, where extracted air is also fed into a heat recovery system.

In winter, the surface cooling systems can be used in reverse for heating or for maintaining a base temperature. The geothermic, regenerative coolant source then also serves as a low-temperature heat source that, combined with a heat pump, can be used for very efficient operation of floor heating. Unique architecture—with built-in Vorsprung durch Technik.

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Audi Centre Hatfield terminal update

A multi-phased and multi-faceted development, the Audi Centre Hatfield terminal is scheduled to open its doors to the public at the beginning of December 2009.

"The substantial investment by the Hatfield Group is a sign of business confidence in the Audi brand in South Africa," says Ryan Steyn, General Manager Sales & Marketing Audi South Africa.



A special kind of brand experience, combined with ecological responsibility. The dark surface on the floor and some areas of the walls absorb heat, and a part of the climate control concept.