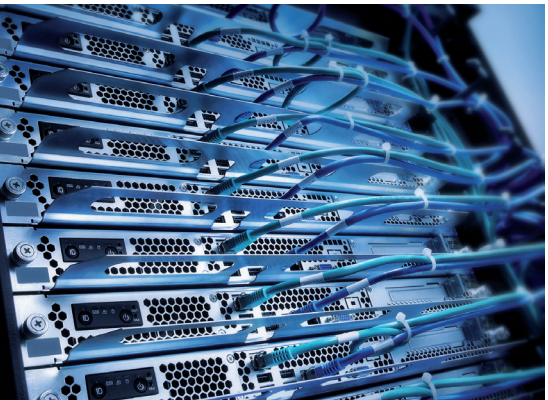
Helping data centres keep their cool.

Germany

Large-scale data centres gather, process and store countless quantities of data. And they have an appetite for energy to match. What is more, regulating their climate is a security issue too. In a bid to tackle this challenge, Hoval has joined forces with e-shelter – one of the world's leading data centre operators –to develop an energy-efficient solution. Featuring a modular structure, the new system can be tailored to meet the precise dimensions and requirements of data centres. Hoval's experience is helping to ensure this is a cutting-edge solution.

Climate really matters in today's world – and that doesn't just mean the natural variety. If data centres did not have air conditioning facilities, the operating abilities of the servers they house would be thrown into jeopardy. And nowadays, it is data that keeps the world going round. Christian Richter, Hoval segment manager for data centres, gives one example of the consequences of server failure: "For a major bank, just half an hour without data could result in losses amounting to several million euros".



Reducing high levels of energy consumption

A large number of companies and organisations make use of external data centres with the aim of maintaining security and availability in any circumstance. International company e-shelter is one of the world's biggest providers of these centres: it designs, develops and operates them at a number of different sites within Europe.
According to Christian Richter, air conditioning accounts for up to half of the energy required by a data centre. "It's precisely in this area that we can apply our expertise and provide a helping hand in the form of Hoval technology."

The name of the game: Energy efficiency

e-shelter currently operates a 1600 m^2 data centre in the German town of Rüsselsheim. Here, it has brought Hoval's expertise on board in the key area of air conditioning: working together with specialists from e-shelter, a team from Hoval has developed a new, energy-efficient solution. Stephan Eder, Director Business Unit Climate Technology, and project manager Rolf Außerer, have devoted two years to the development project and the resulting system, named

Hoval ServeCool, is now set for its large task that lies ahead of it. All 36 air conditioning units were delivered to Rüsselsheim in June of this year.

Innovation from experience

The new system incorporates two of Hoval's core areas of expertise: plate heat exchangers and adiabatic technology, which uses moisture to draw heat out of the air and cools the air in the process. The company's specialists are equally at home with both. Adiabatic technology is already used in the Hoval AdiaVent® recirculation unit, which has proven its worth in hall cooling processes. With the focus on the kinds of conditions that prevail in data centres, the combination of these two areas has resulted in the Hoval ServeCool air conditioning unit, supplied as the OEM product ADK-30 for e-shelter. The number 30 indicates the unit's ability to offer cooling performance at up to 30,000 m^3 of air per hour. Throughout the year, the recirculation unit rarely has to turn to compressors for cooling purposes: "Additional mechanical cooling is only required if the fresh air itself is already very hot and also very humid – the kinds of conditions you'd see before a thunderstorm, for example", explains Christian Richter.

A unique combination

Christian Richter asserts that a combination of fresh air-based free cooling and mechanical cooling like this, offering the kind of efficiency that it does, is an unprecedented step. A good mechanical cooling system is able to achieve an Energy Efficiency Ratio (EER) of 4 to 5. "But this combination's energy efficiency value far surpasses that level, reaching more than 18", states the Hoval specialist.

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Christian Richter,
Hoval segment manager for data centres

Giant plate heat exchangers

The energy efficiency that the ServeCool is able to achieve is down to the plates used in the Hoval cross-flow plate heat exchangers. Featuring a lateral length of 1.20 m, they are the largest individual plates that Hoval, headquartered in Liechtenstein's capital Vaduz, produces in its "S" design. Accordingly, this dimension allows for higher-than-average temperature efficiency. In total, the nine air conditioning units installed over each 400 m^2 area at the Rüsselsheim site will remove a heat output of 1 MW.

Sophisticated control technology

Expertise and experience are also at the heart of the new control system that has been developed for the Hoval ServeCool units. Specifically, the high security standards associated with the application demand a high-quality, reliable system for measurement and control. This is what makes the solution such an amazing innovation.

Modularity provides a leading edge

"Demand for air conditioning systems in data centres is set to grow even further", says Christian Richter. "So the modularity that the ServeCool offers is a real asset. For example, if you're adding another e-suite for additional servers to an existing data centre that features a ServeCool system, then the modular structure means it is really easy to install additional air conditioning units too." In fact, the Rüsselsheim data centre is proof of this: the nine Hoval air conditioning units are being incorporated as soon as a 400 m^2 e-suite reaches its completion. ■

Installing the units using a 70-ton crane. Nine ADK-30 units are used to cool one e-suite.