

## Alte Pinakothek

Efficiently cooled masterpieces



<b>Line of Business:</b>	Air conditioning
<b>Application:</b>	Air conditioning
<b>Country / City:</b>	Germany / Munich
<b>Fluid:</b>	Glycol
<b>Product:</b>	Drycooler (V-shape) GFD

The air-conditioning for the world-famous art collection in the Alte Pinakothek gallery in the Bavarian capital of Munich has to be particularly reliable. After all, the renowned gallery houses over 700 paintings from around four centuries. In October 2003, the existing air-conditioning system in the Alte Pinakothek was expanded. The aim was that an air-cooling system integrated into the dry cooling of the existing plant should reduce the volume of pump water used on a sustainable basis.

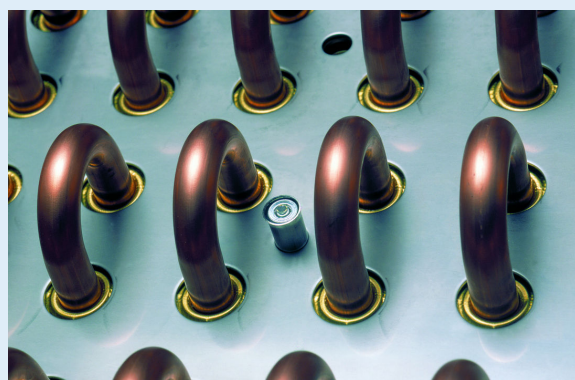
Josef Gruber GmbH from Sauerlach was in overall charge of the project on behalf of the Munich I Public Works Department. The detailed planning of the system extension was carried out by Ervin Peter, an engineering consultancy in Hofolding, Brunnthal, Bavaria. Ervin Peter, Dipl.-Ing., explains: "In order to integrate the air cooling into the existing air conditioning, we designed a new hydraulic system which was later incorporated into the old hydraulic system. In this way, the user can either provide air conditioning using pump water or via the new brine drycoolers using air, depending on the outside temperature."



The brine drycoolers which meet the technical requirements were selected by the system supplier for refrigeration and air conditioning components, Trane Klima- und Kältetechnikbüro GmbH from Krailling near Munich, in close collaboration with Guntner: two space-saving V-coil brine drycoolers from Guntner's GFD series, in a very low-noise design, each with 2 x 7 axial fans. The brine drycoolers are fitted with the proven Guntner floating coil design, which reliably protects the liquid-carrying core tubes against leakages in the long term. Each of the two drycoolers is integrated into the closed cooling circuit with a dry cooling capacity of 450 kW: because the building is a Listed Building, it was not possible to find anywhere to install the air-cooled drycoolers in the Alte Pinakothek building itself.



Each of the Guntner V-coil drycoolers is fitted with the proven Guntner floating coil design.



The proven Guntner floating coil design

### Guntner's V-block brine drycoolers

The only possible installation location, from the point of view of the Listed Building Requirements, was the roof of the neighbouring Geological Institute of the Ludwig Maximilian University, which is on the opposite side of the road. The water/glycol mixture to be cooled arrives at the drycooling units with a maximum temperature of 36 °C and is then piped under the road at 30 °C to the Trane cooling water units, which are switched in when required and operated with water cooling.





Installation of one of the two GFD units on the roof of the Geological Institute of the Ludwig Maximilian University

### Noise and structure-borne sound insulation

The installation of the brine drycoolers on the roof of the Geological Institute, however, meant that a number of special measures had to be taken: Because the dry coolers, which are 8.4 m long, 2.2 m wide and around 2.2 m high, are only 30 m away from the residential buildings nearby, it was necessary to built a 13 m long sound insulation board so that the sound emission guideline value of 35 db(A) at a distance of 30 m would not be exceeded. Ervin Peter explains: "We knew about this from the beginning. Compact brine drycoolers in the required performance category with this number of fans and with a total noise level of less than 35 db(A) at the same time are simply not available on the market at the moment."



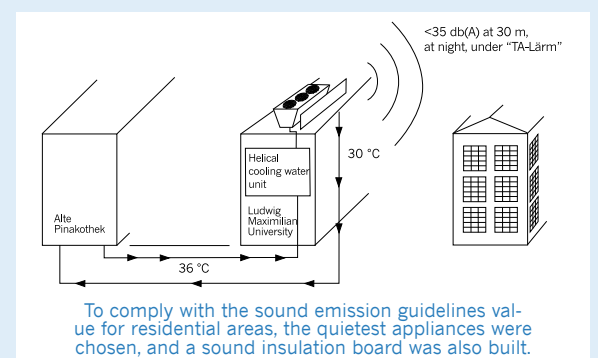
Güntner's V-coil drycoolers are placed by helicopter exactly where they are needed, on the roof of the Ludwig Maximilian University opposite the Alte Pinakothek.

Another requirement had to be met: in the Geological Institute, there are laboratories underneath the brine dry coolers which work on occasion with highly sensitive seismic measurement devices, which meant that it was vital that no disruptive vibrations should be transmitted to the body of the building. Using special stainless steel vibration absorbers from the extensive range of Güntner accessories, which were specially matched to the weight of the equipment and the speed of the fans, it was possible to achieve structure-borne sound insulation of between 85 and 90 %.



Vibration absorbers for insulation against structure-borne sound, installed under the feet of the units

### Switching over to air cooling



To ensure a smooth transition from the existing system of cooling with pump water to the new drycooling with air, the new system elements were produced completely first of all and then integrated into the existing system within a day: "We estimate that around two thirds of the entire operating time is now covered by the new air-cooled drycooling system, which means that the operators are saving around

250,000 cubic metres of pump water a year. Nonetheless, the system still circulates around 100 m<sup>3</sup> of water an hour under full load", comments engineer Ervin Peter.

