The DESY Research Center

> DESY is a world leader in particle accelerator research. At their Hamburg, Germany facility, the company designs, builds and operates large particle accelerators to investigate the structure of matter. The work that takes place there is vital for breakthroughs in fields ranging from medicine to material research.

> **Objective: Retrofit existing cooling towers.**
The DESY Hamburg facility had multiple cooling needs including the PETRA III X-Ray, the DESY II experimental circle particle accelerator and its magnetic circuits, and the facility's centrifugal chillers. To meet these diverse demands the company installed fifteen JAEGGI hybrid dry coolers in various sizes with an aggregate cooling capacity of 25 MW (5,687 evaporative tons).

Solutions: Using state-of-the-art JAEGGI technology, closed-loop cooling cycles were created to minimize fouling, reduce cleaning, improve efficiency and reliability ,and reduce water costs. The majority of the towers installed were standard configuration coolers with heat exchangers made of copper tubing and aluminum fins.

One unique unit, however, was equipped with both the heat exchanger tubing and fins made of aluminum. The research center uses only fresh water with no antifreeze in their cooling towers, so JAEGGI hybrid dry coolers were specially modified to safely operate under these requirements. Therefore, motorized dampers on the suction side and fan shutters on the discharge side were installed on all units.

For optimal water conservation and reduced operating cost, the heat exchangers of the hybrid dry coolers were connected in series of dry and wet mode. This configuration allowed for a very precise set point control and for a dry mode operation up to 25°C outside air temperature. This limited the annual need to operate in wet mode to a maximum of approximately 200 hours.

> Engineering a sustainable future

Individual operation for DESY's 15 units is handled by the ***HybriMatic®S*** single cooler control with Siemens components. All units are subordinate to the ***HybriMaster®S*** control.

Result: JAEGGI's proprietary control technology allows the JAEGGI hybrid dry coolers installed at the DESY Research Center to use up to 80% less water and significantly less energy than traditional towers. DESY has reduced their operating costs while improving the efficient use of resources. Learn more about how JAEGGI's advanced Hybrid dry cooling technology can benefit your company by contacting us today.

Selected Specifications for the Installation at DESY, Hamburg, Germany

1. MAIN DATA FOR ONE INSTALLED COOLER

Type of Hybrid Dry Cooler	HTK 2.4 / 10.9-2S-S3-CU-SX3
Cooling capacity	1,550 kW (325.6 evaporative tons)

1.1 Product Side

Cooling media	0% Glycol / 100% Water
Medium temperatures (in/out)	40.7°C / 28°C
Flow rate	210.8 m³/hr
Hydraulic connection	Series; 3pass; cross counter flow

1.2 Air Side

Operating mode of the cooler	**Wet mode**	**Dry mode**
Fanspeed	100 % nom. rpm	100 % nom. rpm
Air condition at the inlet	35°C / 30%	RH 18.7°C
Corresponds to a wet bulb temp. of	21.5°C	not relevant
Air condition at discharge	35.6°C / 50%	RH 33.5°C

1.3 Wetting Water Consumption

Outside air condition	35°C / 30% RH
Evaporation quantity at 100% capacity	4.59 m³/hr

1.4 Physical Data

Footprint per series cooler	7.86 m x 12.26 m
Overall height of the series cooler	4.5 m
Operating weight of the series cooler	2 x 13.7 t

THE ENTIRE INSTALLATION CONSISTS OF THE FOLLOWING COOLERS

Cooler type	2 x HTK 2.4 / 6.6-2S-S6-CU-SX3
	1 x HTK 2.4 / 7.2-2S-S2-CU-SX3
	1 x HTK 2.4 / 7.8-2S-S4-AI-SX3
	2 x HTK 2.4 / 9.6-2S-S3-CU-SX3
	9 x HTK 2.4 / 10.9-2S-S3-CU-SX3
Controls	15 x single cooler controls HYBRIMATIC®S
	5 x master controls HYBRIMASTER®S
Total installed cooling capacity	**25 MW (5,687 evaporative tons)**

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