Water Cooling for Power Electronics
High performance at heat source – High reliability in cooling solutions

Simulation of Water Coolers and Heat Exchangers
High Performance MDT Cold Plates
Counter-current Extrusion Cold Plates
Water Cooling Stations for low and high voltage

Results are created using Coolit, a software product of Daat Research Corp.
Benefits of High Performance Cold Plates

Power electronics – including higher efficiency SiC switches – benefit from high performance heat sinks. A reduced thermal resistance of the heat sink can be used to increase power output, raise operating ambient temperature or simply extend the life time of the semiconductors.

MDT High Power Semiconductor Cooling
Eliminating the thermal grease layer and increasing solid to liquid heat transfer are the most effective measures to maximize cooling efficiency. The latter benefits most from a large surface area, more than from increased fluid velocities. Our MDT (micro deformation technology) cold plates have proven to allow for 10% higher electrical output than other high performance cold plates.

Popular Snake Channels
Snake channel designs offer good thermal performance and easy manufacturing using friction stir welding or brazing. Snake designs can also include counter-current channels that create more uniform temperature distribution.

Counter-current Enhanced Surface Extrusion Cooler Plates
Counter-current enhanced surface extrusion cooler plates offer uniform temperature across and between components, i.e. typically temperature unbalance of merely 0.5 K/kW/component. The counter-current flow configuration requires only half the flow rate compared to a parallel/diagonal in-out flow configuration.
Design & Components of Water Cooling Loops

Water cooling stations for MV and HV up to 2 MW

Our cooling stations for medium and high voltage applications – such as static var compensators – feature high reliability and long maintenance intervals. One of the high-lights is the integrated system check during commissioning or maintenance, that includes preforming and leakage test of heat exchanger and converter. Other features are continuous catastrophic and very sensitive leakage detection systems and fully redundant sensor and control systems among others. The pressurized systems are designed for 0 kg/a coolant loss and clean water for years. Corrosion is virtually non-existent. This is achieved by careful selection of wetted materials. Corrosion free, clean water and minimal loads on the purification loop have been observed over many years.

Compact water cooling stations up to 300 kW

Space and footprint are valuable in the nacelle of a wind turbine or a marine application. Our compact water cooling stations make use of multi functional manifolds that save space and still allow for easy maintenance. Features include automatic internal de-aeration, short commissioning time, leakage detection and PLC controls. Optional available are compact redundant pump systems, touchscreen HMI and others.

Simulation tool for cooler plates and heat exchangers

Maximum junction temperature and ambient air temperature are key parameters for a cooling system for power electronics. Where the maximum junction temperature is a given, heat load and sometimes allowable ambient temperature are to be pushed to the limits for a given size or budget. Our design tool for cooler plates and heat exchangers gives quick answers to thermo and fluid dynamic behavior of a cooling system.

Air Blast Coolers

A variety of tubes pattern, fin spacing, turbulence promotors and circuit arrangements allow custom designs that meet of virtually any thermal and hydraulic performance requirements. Our customized stainless steel tube coils are made to weather any condition. Their quality is proven since decades and manufacturing complies with international standards.
enabling your ideas.
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