

At the heart of our **DBC coolers**, there is a microchannel structure made of thin copper foils that are put together into a hermetically tight block in the curamik bonding process. The specific microchannel structure determines the thermal resistance, pressure drop and flow rate. The coolant is usually led in and drained through openings connected with o-rings or screw fittings.

Liquid coolers are an ideal solution for high-power applications. The electrical circuit on the cooling area can be customized.

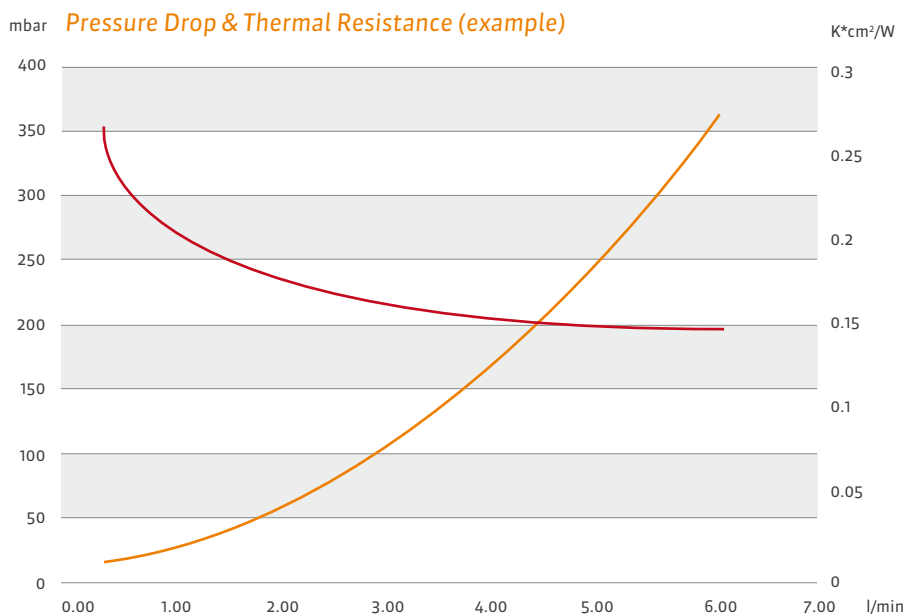
Advantages:

- // Four times more efficient cooling than with traditional liquid cooling
- // Lower weight
- // Smaller sizes

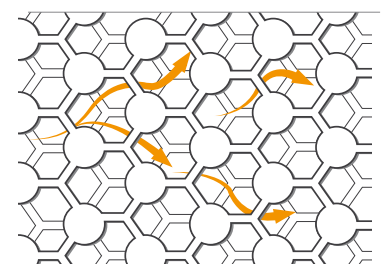
We offer the following versions:

- // integrated DBC coolers with top and bottom AlN DBC for high performance applications (>3 kW heat dissipation)
- // integrated DBC coolers with top and bottom Al₂O₃ DBC for standard applications (1-2 kW heat dissipation)
- // non-integrated copper coolers as cost-efficient version and for encapsulated devices

Vias (front/rear DBC through the microchannel structure) or isolated feedthroughs are possible for isolated coolers.



Liquid Flow (example)



- Thermal Resistance
- Pressure Drop

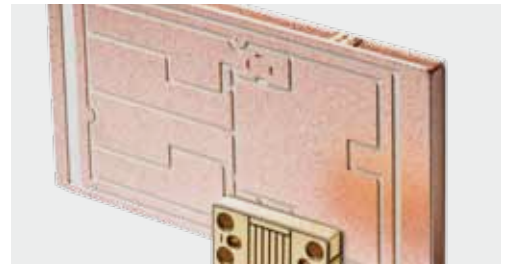
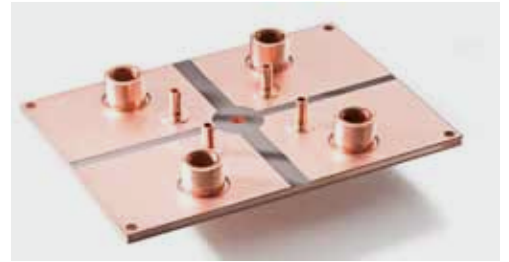
Integrated DBC cooler with Al₂O₃ or AlN

The DBC cooler consists of several layers of structured copper foils and a top and bottom layer made of DBC substrates (Al₂O₃ or AlN). The etched copper layers form the DBC three-dimensional cooling structures.

DBC substrates are used for mounting the components. They enable direct assembly of the components (chip on board) due to their isolation against the cooling circuit. The design of the different layers and the electrical circuit of the DBC substrate can be designed customer-specifically. The different layers are connected in the curamik bonding process.

The advantage of this process is that no additional soldering or adhesive layers are negatively influencing the cooler's thermal resistance.

DBC coolers are currently used for cooling high-performance components, laser diodes or solar-cell arrays.



DBC Copper Cooler

The DBC copper cooler consists of several layers of pure copper with very fine structures. These layers create three-dimensional structures for cooling high-performance electronics. The design of the different layers can be adjusted to customer-specific requirements.

During the curamik bonding process, the different layers are connected to each other. This process does not use any additional soldering or adhesive layers that would negatively influence the cooler's thermal resistance.

For special applications such as laser diode cooling, the top and front surface of the cooler can be diamond-milled to get the best flatness for mounting the laser diode.

curamik laser diode coolers are used with high power laser diodes in the range of 20 to more than 100 W. Applications for these coolers are laser diode stacks which are used in diode pumped lasers or diode lasers for industrial, medical and research applications.

