

# curamik® COOLING SOLUTIONS

Product Information

Rogers offers two kinds of cooling solutions – coolers for liquid or passive cooling.

For liquid cooling Rogers offers the **curamik® CoolPower** and **CoolPower Plus** as well as the **curamik® CoolPerformance** and **CoolPerformance Plus**. At the heart of these liquid coolers, there is a micro or macro channel structure made of thin copper foils that are put together into a hermetically tight block using the curamik bonding process. The specific channel structure determines the thermal resistance, pressure drop and flow rate. The coolant usually enters and exits through openings connected with o-rings or screw fittings. Liquid coolers are an ideal solution for high-power applications.

#### Advantages

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

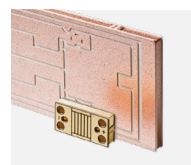
The **curamik® CoolEasy** is a high precise machined copper cooler for passive laser diode cooling.

## curamik® CoolPerformance curamik® CoolPerformance Plus



High performance liquid coolers for laser diode applications

## curamik® CoolPower curamik® CoolPower Plus



Liquid coolers for high power applications like CPU for data centers, direct cooled power modules, high brightness LED or solar-cell arrays (CPV)

## curamik® CoolEasy



Passive cooling for laser diode applications

## curamik® CoolPerformance curamik® CoolPerformance Plus

The **curamik® CoolPerformance** coolers are high performance copper coolers for laser diode cooling. The coolers consist of several layers of pure copper with very fine structures. These layers create three-dimensional micro- or macro-channel structures for cooling laser diode bars up to 5 mm cavity length.

**curamik® CoolPerformance Plus** coolers are high performance isolated copper coolers which additionally contain an AlN isolation layer on top and bottom. The AlN isolation layers separate the water channels from the electrical contact to the laser diode and reduce the CTE value of the cooler to 5 – 6.5 ppm/K. The top and front surface of these coolers can be diamond-milled to meet the exacting needs of flatness of laser diodes.

Both types of coolers can be 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 direct diode lasers for industrial, medical and research applications.

## curamik® CoolPower curamik® CoolPower Plus

The **curamik® CoolPower** consists of several layers of pure copper with very fine structures. These layers create three-dimensional structures for cooling high-performance electronics. During the curamik bonding process, the different layers are hermetically combined without any additional soldering or adhesive layers.

**curamik® CoolPower Plus** coolers are integrated DBC coolers with ceramic substrates (Al<sub>2</sub>O<sub>3</sub> or AlN). The DBC substrate-layers enable direct assembly of the components (chip on board) and provide at the same time electrical isolation from the cooling circuit.

**curamik® CoolPower** and **curamik® CoolPower Plus** are used for the cooling of high-performance components, high brightness LED or solar-cell arrays.

## curamik® CoolEasy

**curamik® CoolEasy** is a high precise machined copper cooler, which is used as CS-Mount for conductive cooling of laser diode bars. The top and front surface of the cooler can be diamond-milled to meet the exacting needs of flatness of laser diodes. Applications for these coolers are diode pumped laser modules or direct diode lasers for industrial, medical and research applications. **curamik® CoolEasy** copper coolers are used with high power laser diodes in the range of 20 to 80 W.

