



# **Looking for high- performance cooling?**

**Individual cooling solutions for your project!**

## About EKL AG

For 25 years EKL AG, located in Leutkirch im Allgäu, has been developing and manufacturing cooling solutions for the electronics industry.

Independent of the individual sectors EKL AG offers a wide range of innovative manufacturing technologies. In addition to numerous standard solutions, fans and accessories, EKL AG also provides customer-specific cooling solutions, even for small quantities.

Thanks to many years of experience in the field of thermodynamics and the use of the latest development tools, such as e.g. simulation software and thermography, EKL AG is able to deliver optimal solutions quickly and flexibly.

You can also benefit from our vast know-how and convince yourself personally of the preferred service of EKL AG.

**Our service:  
All from one source**



**Your reliable partner from  
the first idea to series production,  
including logistics!**

## LED COOLING

Customized cooling solutions

Housings

### Applications:

internal and urban lights,  
technical lights for special  
applications

## INDUSTRY COOLING

Customized cooling solutions

Fans and accessories

### Applications:

Medical technology,  
power electronics,  
automation, embedded  
systems, server and desktop

## CPU COOLING

High-end CPU cooler  
for Intel® and AMD

Fans and accessories



## DEVELOPMENT

Mechanical Design

Thermography

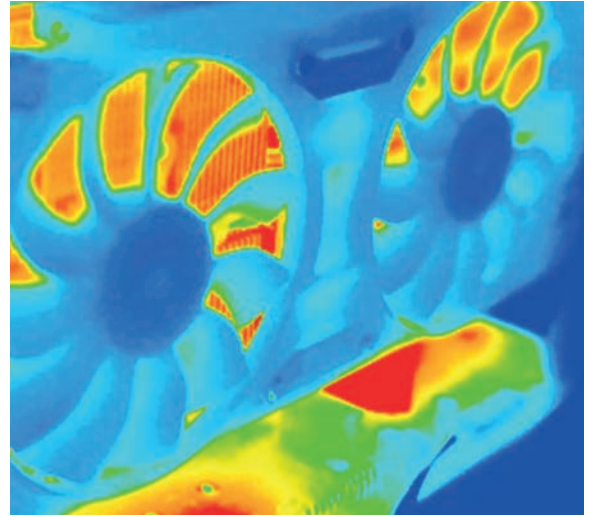
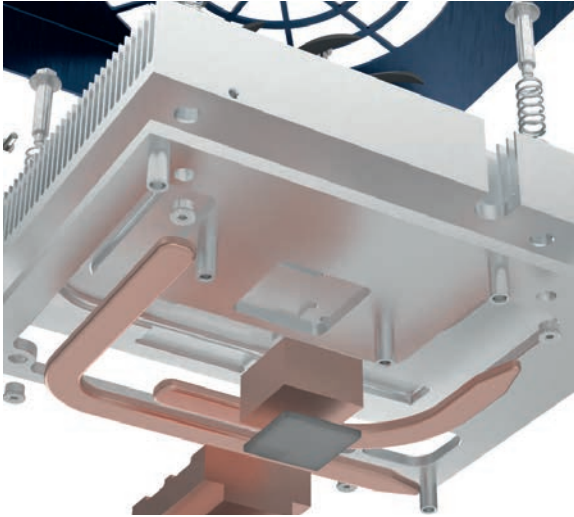
Thermal simulations

## Certification and sustainability

- DIN ISO 9001 : 2015
- AEO certificate
- Climate certificate for sustainable environmental protection
- CO<sup>2</sup> savings through photovoltaics
- REACH regulation
- RoHS guideline
- Sponsoring local clubs and events

## Development

Since our foundation 25 years ago we have been developing customer specific cooling solutions as well as standard products for electronic applications of all kinds. Our engineers have gained experience over decades in the area of thermal solutions design.



## Construction and design

- Thermal and mechanical design
- Feasibility studies
- Optimal usage of available space
- Selection of the most suitable and cost-effective manufacturing technology

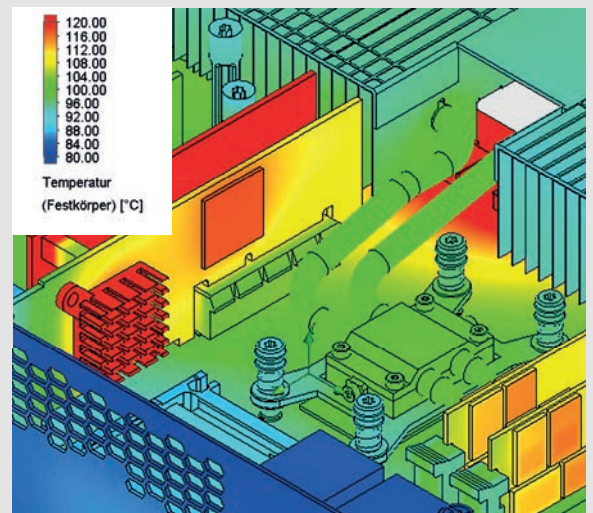
## Thermal measurements

- Measurements of complete systems
- Thermal measurements in different orientations
- Measurements of single components
- Measurements based on customer requirement
- Thermography

## Thermal simulations

By integrating the thermal simulation into the system development at an early stage, thermal problems can be identified and remedied early. Cost and performance optimizations can be implemented immediately. Thermal simulations save valuable development time!

In order to get you to your goals faster, we have greatly expanded our development department and further optimized our processes. By combining modern software and the latest hardware, we have high computing power to keep simulation times short.

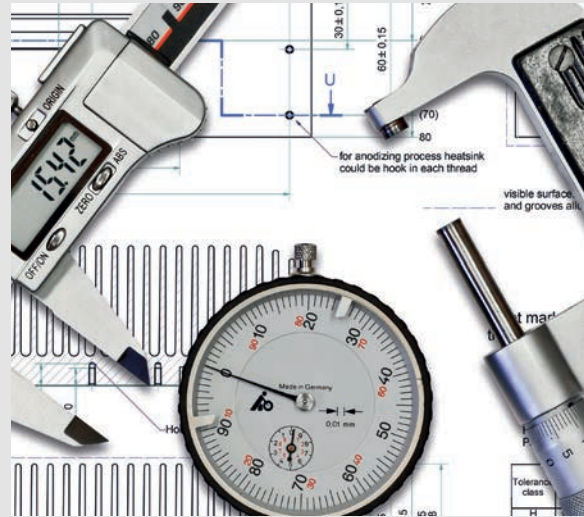


# Prototyping

Do not leave anything to chance and use functional prototypes!

We manufacture prototypes close to series for you. This enables you to verify your cooling solutions under real conditions. Increase your planning security and test defined properties of your cooling solution.

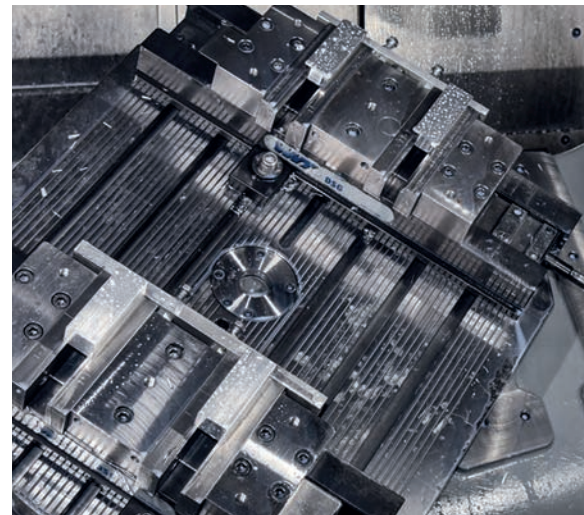
The quick implementation not only saves development time, but also costs.



# Series production

We manufacture for you in Germany and Asia, from small to large series, from simple heat sinks to complete cooling modules and pre-assembled solutions.

Thanks to the modern machine park with 3-axis and 5-axis simultaneous machining centers, we are able to manufacture complex machined and high-precision parts for you.



# Logistics

We offer you individual logistics arrangements for maximum flexibility through generous storage capacities and individual delivery agreements. We can take over your warehousing and deliver the quantity you actually need at the right time. In addition, unplanned fluctuations in demand can be immediately compensated for by short reaction times.

## Warehouse

- Just in time delivery
- Consignment agreement
- Frame order agreement
- Delivery schedule

## Delivery

- Parcel delivery
- Pallets delivery
- Over-night delivery
- Extra tours

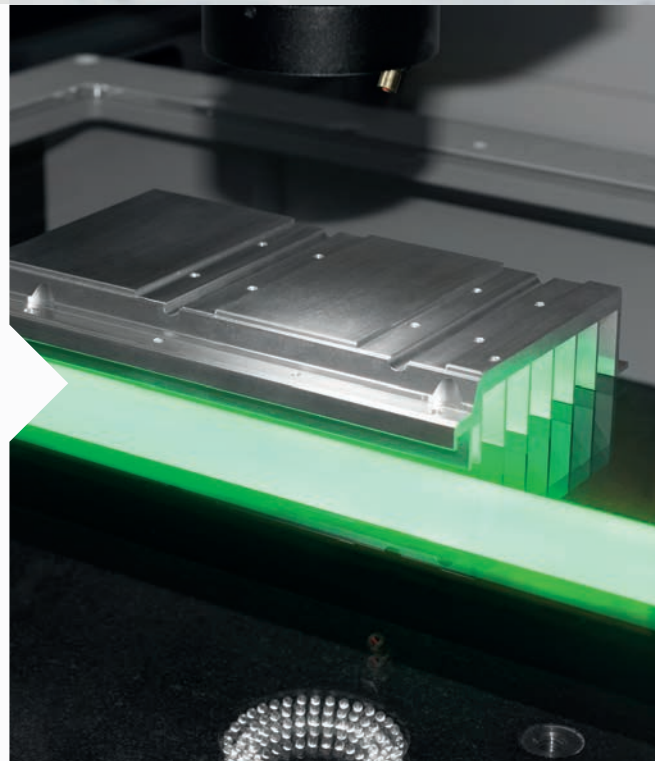
## Inspection of all goods received

All goods received are thoroughly inspected, under consideration of your individual requirements. EKL AG can perform visible inspections, dimensional inspections, mechanical and electrical inspections as well as thermal tests. Further can the downforce provided by your cooling solution be measured to ensure optimal contact with your chip. For cold plates, the leak tightness can be measured.



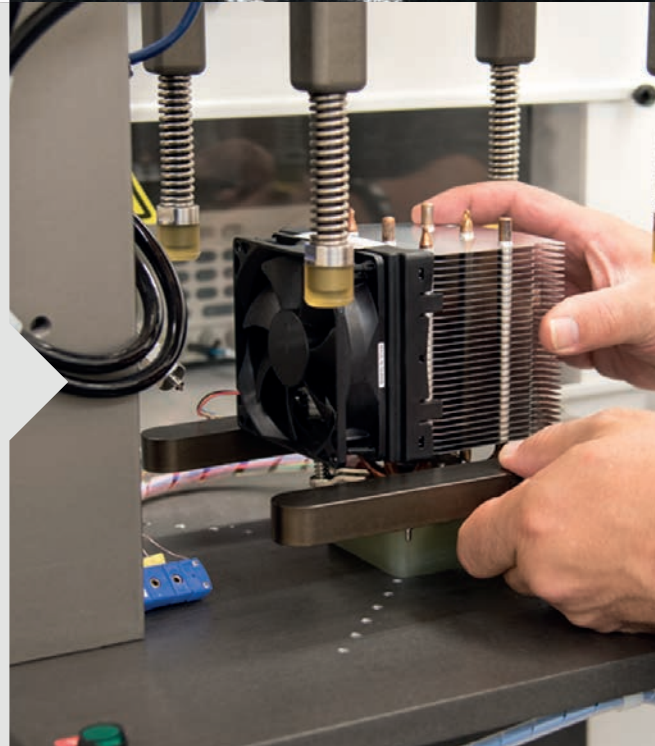
## Measuring microscope

The measuring microscope, which is also programmable, supports us with high-precision, repeatable measurements of complex heat sinks and components. From the manual 2-axis system to the 3-axis system with automatic edge detection, the measuring microscope offers the most varied configurations of software and hardware for your specific measurement requirements.



## Thermal measurement device

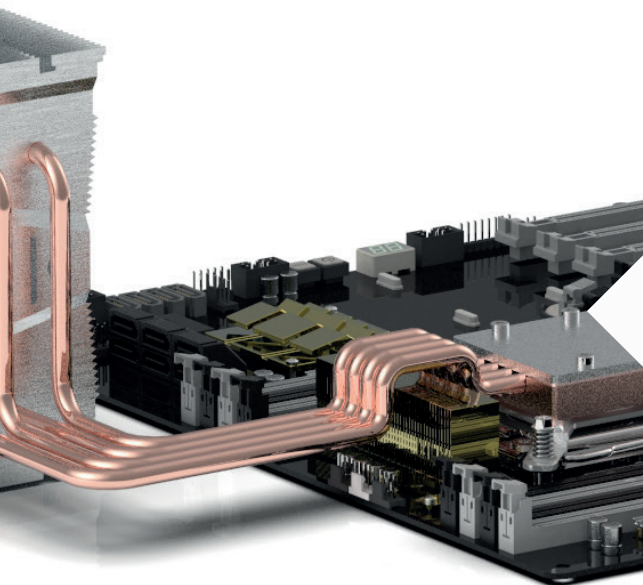
The thermal rapid measuring device serves as a comparison test for the initial samples or your defined default samples. In addition, orientation-related thermal tests can be carried out. This ensures that the products in their respective installed condition cool optimally in your application.





## 3D coordinate measuring machine

By means of the 3D coordinate measuring machine your product can be measured efficiently, exactly and repeatably. Even products having extremely narrow tolerances can be measured to 0,001mm.



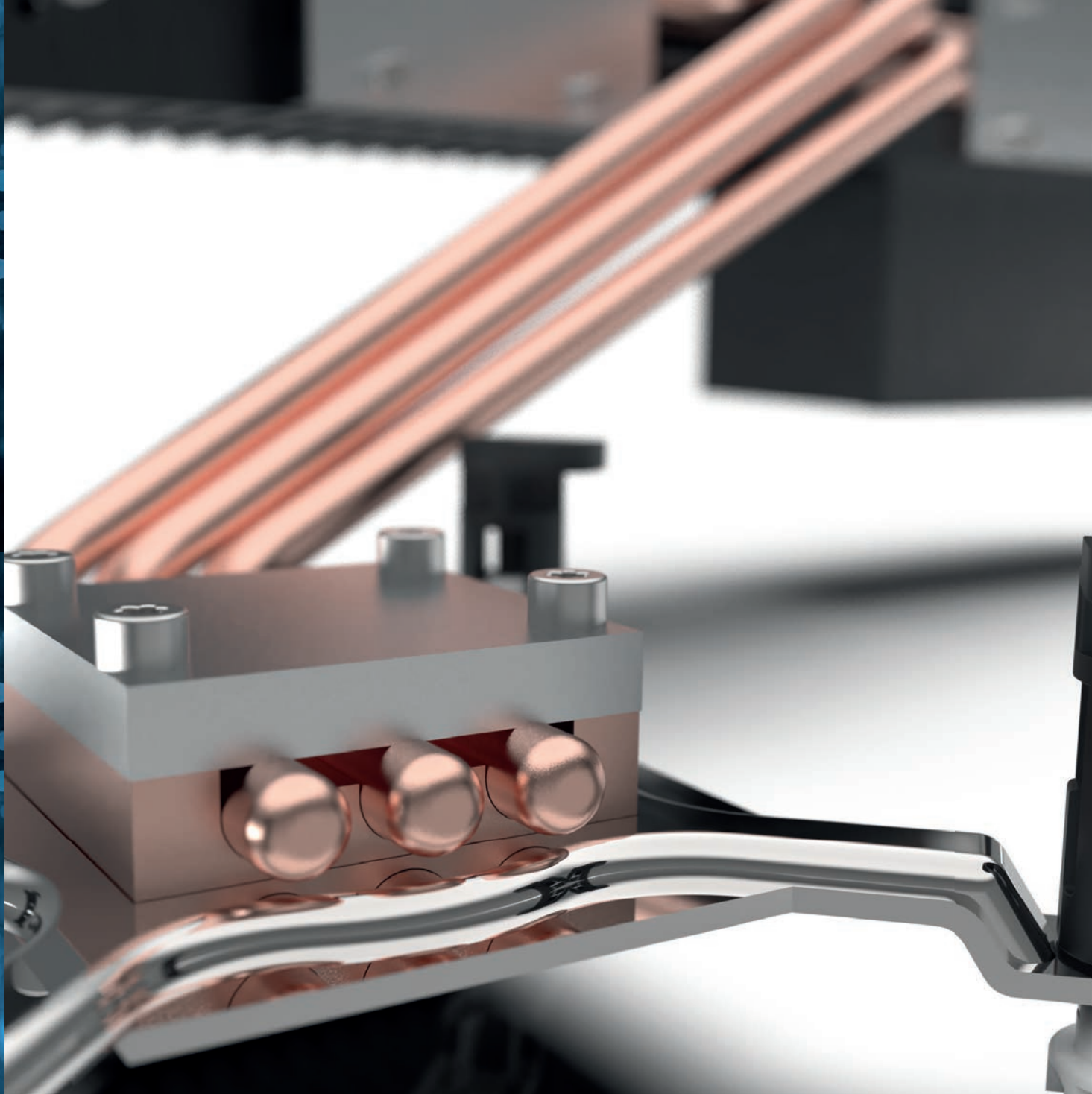
## Mounting / assembly trials

The compatibility of your cooling solution with your applications' requirements can be ensured through mounting trials. These mounting trials not only ensure the mechanical fit, but also that the required clamping force is met.

0,100	4,200	4,300	npm	OK	acc
			npm	OK	acc
0,100	3,700	3,900	npm	OK	acc
0,050	4,150	4,250	3,8	OK	acc
0,100	0,900	1,100	4,22	OK	acce
0,100	6,150	6,350	1,07	OK	acce
0,100	3,900	4,100	6,29	OK	acce
0,100	1,900	2,100	4,03	OK	acce
0,300	35,200	35,800	1,95	OK	accep
0,200	17,300	17,700	35,75	OK	accep
0,100	4,500	4,700	17,45	OK	accep
0,200	6,300	6,700	4,52	OK	accep
0,100	1,500	1,700	6,32	OK	accep
0,100	3,900	4,100	1,7	OK	accep
0,200	7,800	8,200	4,04	OK	accep
0,200	12,800	13,200	8,12	OK	accep
0,100	5,900	6,100	13,16	OK	accep
0,200	17,800	18,200	6,06	OK	accepte
			17,89	OK	accepte
			OK	OK	accepte
3,300	36,000	36,600	36,37	OK	accepted
3,300	44,100	44,700	44,43	OK	accepted
3,300	36,000	36,600	36,28	OK	accepted
3,300	44,100	44,700	44,53	OK	accepted
1,000	3,000	3,200	3,07	OK	accepted
1,200	13,300	13,700	13,46	OK	accepted
1,200	4,900	5,100	5,09	OK	accepted
1,200	17,800	18,200	17,9	OK	accepted
1,200	1,900	2,100	1,97	OK	accepted
1,200	24,800	25,200	25,0	OK	accepted

## Specific inspection plans

We can inspect your cooling solutions to your individual inspection requirements and plans; even 100% measurements / inspection of critical dimensions as per your requirements are possible.



## Wide range of manufacturing technologies

EKLAG offers you a wide range of different manufacturing technologies and, based on many years of experience, a sophisticated know-how in designing the most efficient cooling solution for you. Areas of application include IT (server and desktop), medical technology, LED, power electronics, automation, laser technology and much more.

- Wide range of manufacturing technologies
- Various processings and surface finishings
- Specific solutions starting from small quantities
- Everything from one source

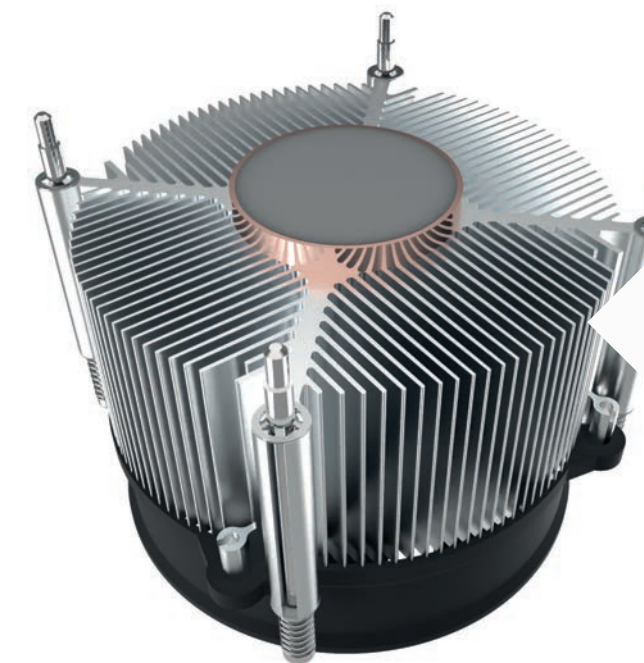




## Heatsinks with heat pipes

### Your advantages

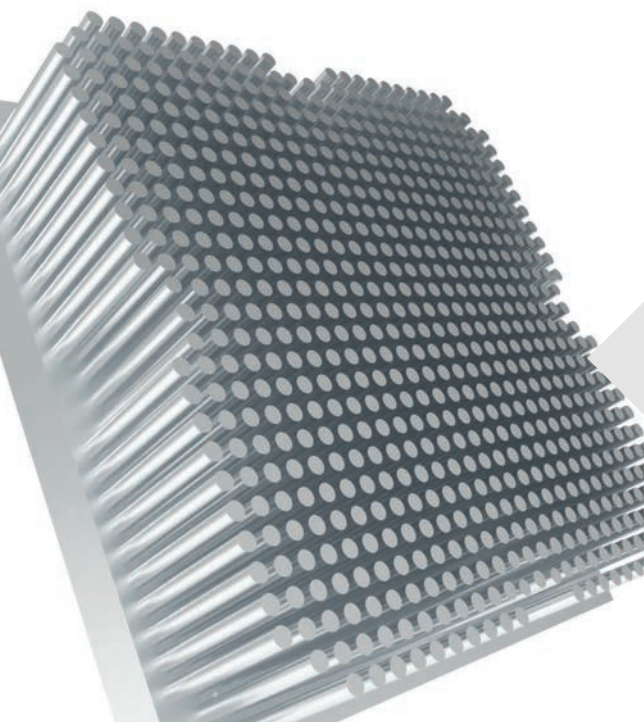
- Very high thermal conductivity
- Can be combined with other technologies
- Heat transfer over longer distances possible
- Scalable performance and flexibility by increasing the number of heat pipes
- Specific selection and design of heat pipes (Qmax, position, quantity, length and bend)
- Selection of the latest heat pipe technology



## Extruded heatsinks

### Your advantages

- Low tooling costs
- Can be combined with other technologies
- Standard process
- Good thermal conductivity
- Various surface finishes possible (nickel plating, painting, powder coating)



## Cold-forged heatsinks

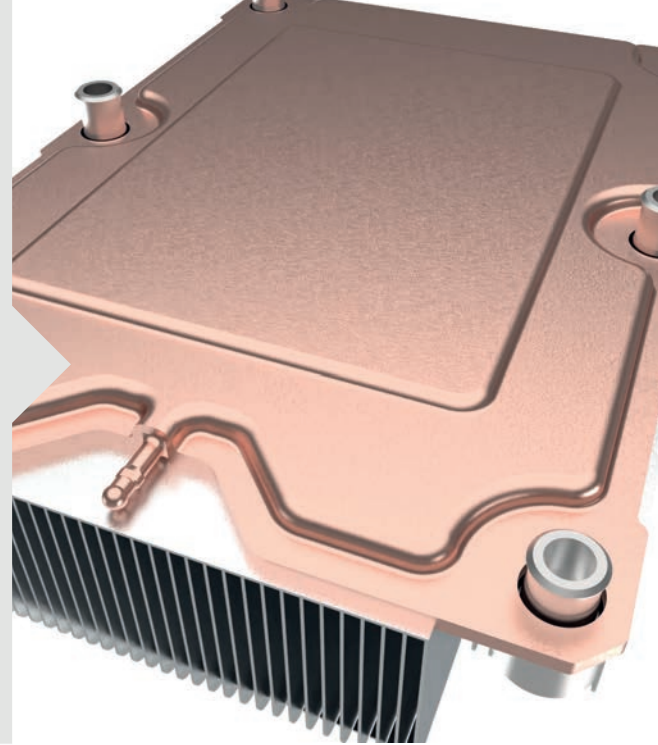
### Your advantages

- Combination of copper and aluminium possible
- Standard sizes available
- More complex geometries compared to Extrusion possible
- Large surface area through round pins
- High material density
- High-purity aluminum with very high thermal conductivity
- Various pin geometries possible

## Vapour chamber heatsinks

### Your advantages

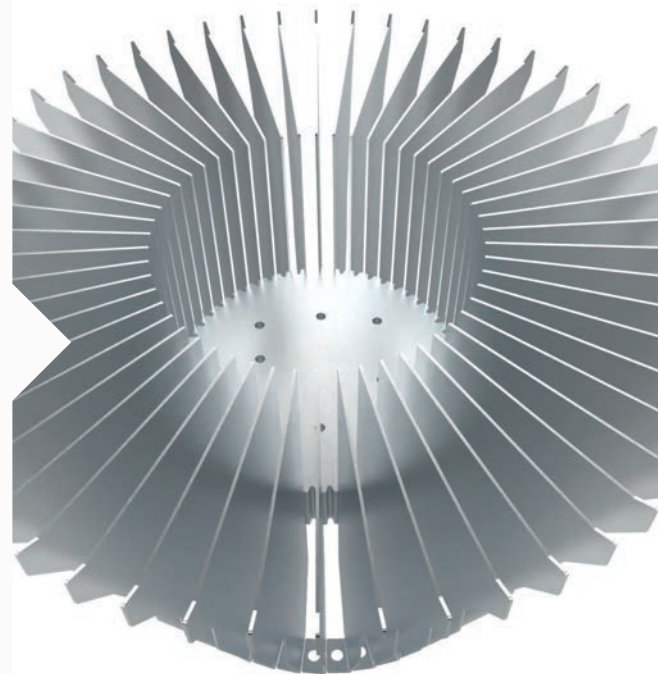
- Rapid heat dissipation possible in the smallest space
- Good thermal conductivity and high Qmax
- Very reliable and less interference from gravity
- High contact pressure possible - paired with simple assembly you can dispense with e.g. base plates and retaining clips
- Can be combined with other manufacturing technologies



## Crimped heatsinks

### Your advantages

- Solder-free connection (mechanical process)
- Various surface finishes possible
- Copper aluminum combination possible
- No fin connection needed
- A lot of thin fins lead to a big surface area available



## Soldered heatsinks

### Your advantages

- Standard process
- Copper aluminum heatpipe combination possible
- Large surface area through a lot of thin fins in a small area



## Skived fin heatsinks

### Your advantages

- Copper and aluminum coolers “out of one piece”
- Low tooling costs
- High fin density possible

## Die-casting heatsinks

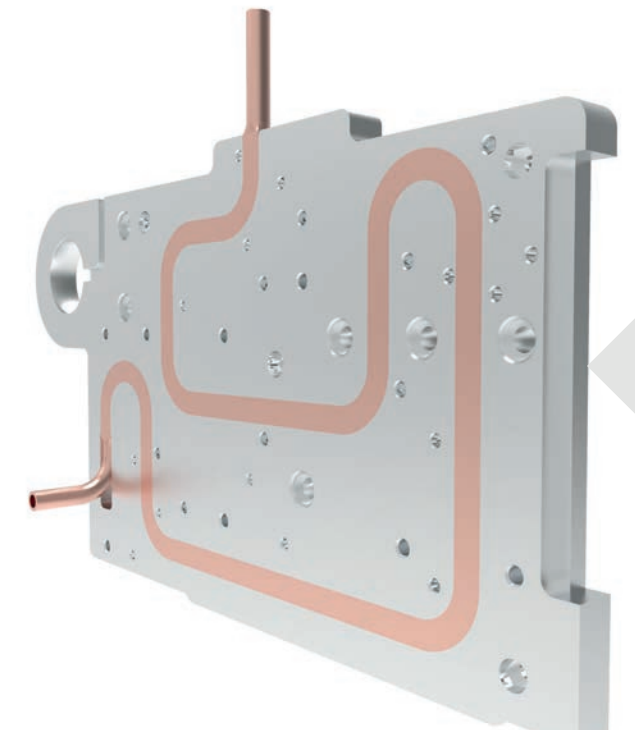
### Your advantages

- Cheap unit prices
- Complete housings possible
- More complex geometries compared to extrusion possible

## Liquid cooling plates

### Your advantages

- Better heat dissipation than with air cooled heatsinks
- Particularly suitable for tight spaces
- Easy possibilities to dissipate the heat to another place
- Easy connection to existing cooling circuit possible
- Higher heat loads and fluxes possible



## Friction stir welding

### Your advantages

- Joining without contact resistance
- Without additives and strength losses
- Allows very large designs (by joining several cooling profiles)
- Uniform thermal conductivity



## Swaged heatsinks

### Your advantages

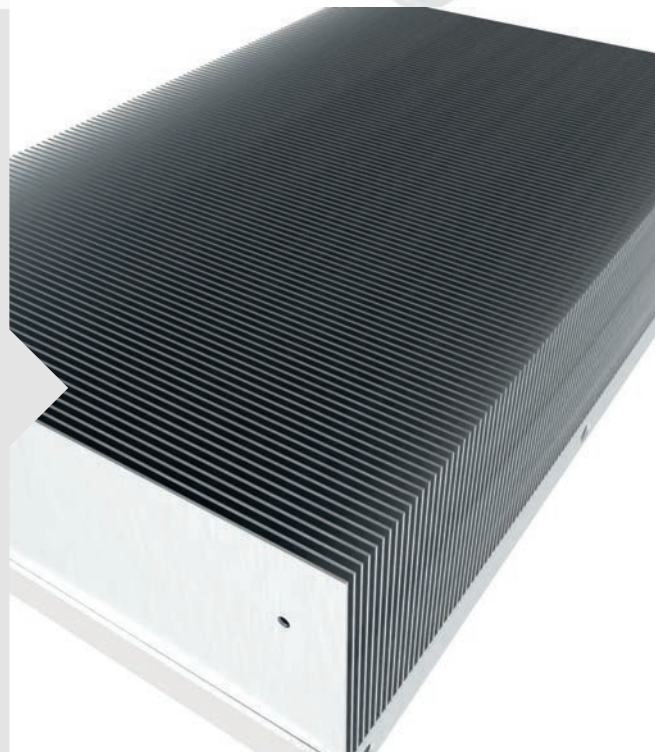
- Scalable length and width
- Good thermal conductivity
- One time tooling costs if using a customized profile
- No tooling costs if a standard profile is used



## Bonded fins

### Your advantages

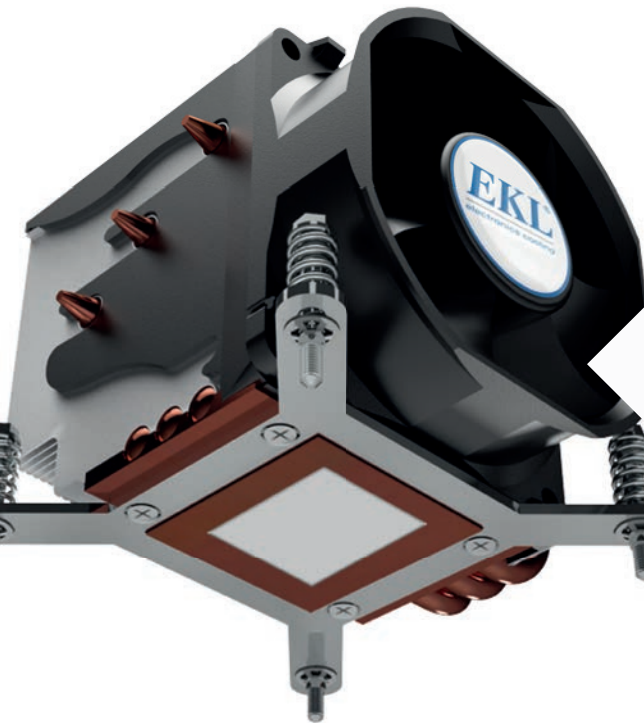
- Cheaper alternative to soldering
- High fin density allows improved heat dissipation
- No material distortion
- Lower quantities feasible





## Surface finishes

- Anodizing, colored or natural
- Nickel-plating
- Chromating
- Powder coating
- EPD coating
- Painting



## Mounting components

- Screws
- Springs
- Push-Pins
- Backplates
- Thermal compounds and pads



## Product specific packaging

- Best protection during transport
- Ideal for resale
- Recyclable materials



## Large selection of fans

EKL AG has a wide variety of fans from reputable sources in stock, apart from standard fans, which are stocked, the procurement of special fans and assemblies can be supported. Further can the required fans be configured with individual connectors and cable lengths, all done at the facility in Leutkirch to ensure you get the right fan / cable and connector assemblies, even individually packed, if required.

- Large stock of a variety of fans and blowers
- Individual configurations of connectors to your requirements possible
- Auxillary products (finger guards, anti-vibration mounts)



## Your advantages

### ■ Everything from one source

With us you have a partner who takes care of the cooling solution of your electronics: From development to prototyping to series production and the takeover of logistics services.

### ■ Competence, continuity, stability

Over 25 years of experience in the field of electronics cooling as well as long and reliable partnerships with suppliers.

### ■ Favorable prices with a high quality standard

Development and quality assurance take place in Germany and series production at our partners in Asia.

### ■ The ideal manufacturing process

Wide range of different manufacturing technologies paired with extensive and well-founded know-how.

### ■ Security and responsibility

Your contacts can be reached quickly. As a German manufacturer, legal aspects are also clearly regulated.

Handed over by:

***EKL***®  

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*electronics cooling*

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