Liquid-cooled Heat Sinks

Kinto Electric Co., Ltd.
Kinto Electric Co., Ltd. (China)
Liquid-cooled Heat Sinks / Cold Plates

About Us

Kinto Electric Co. Ltd. is a group with four manufacturing plants in China & specialized in production of liquid cooled heat sinks, copper connection parts, insulation parts and mechanical assembly parts. We are ISO90001 certified manufacturer with 15 years expertise in related technologies. With high quality and competitive price, we already deliver to customers worldwide including ABB and Siemens.

We produce liquid cooled heat sinks with advanced CNC machining and Friction Stir Welded (FSW) technology. For this specific product, we have in-depth knowledge of manufacturing processes, and our plants are equipped with advanced production machines and quality checking devices. Our engineering team can support customers for all technical issues, from material selection, manufacturing processes, design analysis, performance simulation, surface finish to fabricating tools.

Kinto heat sink features:

- Fine machined heat sink body and surface with high accuracy
- Low pressure drops
- Dual-sided cooling capability
- Possibility of large heat sink size
- Compatibility with industry accepted coolants
- Friction Stir Welded (FSW) joints for excellent non-leakage and high pressure rating performance as well as high resistance to corrosion
Kinto: Competence for Making High Quality Liquid-cooled Heat Sinks

Heat Sinks’ Design & Performance Simulation

Before building prototypes, the software is used to carry out heat transfer and fluid flow analysis and to perform validation of design.

During the heat sink prototype development, the extensive know-how for hundreds heat sink designs enable us to optimize new variations to meet specific requirements promptly. We use the advanced software ICEPAK to make design and performance simulation, which provides powerful computational fluid dynamics for electronics thermal management.

After the prototype production, the design can be tested with our heat sink performance testing center.

CNC Machining of Heat Sink

With advanced CNC machines, we make machining for heat sinks with high precise, repeatable, and reliable results.

- Matec-30HV is a 4-axis universal machining center which can process big-size (length 5m and width 0.8m) parts with high precision.
- Hammond CNC machine is well-known for deep-hole processing technology. With the machine the holes with diameter 5-25mm / depth up to 1m can be processed with high precision.

Finished parts are thoroughly inspected to verify accuracy.
Sealing of Heat Sinks - Friction Stir Welding (FSW) Technology

FSW is a solid-state joining process in which the welding is done with frictional heat generated between the welding tool and the materials of the work pieces. The heat causes the stirred materials to soften without reaching the melting point so that a solid-state joining could be achieved. The joint has a homogenous structure with mechanical properties similar to the parent materials of welded parts.

FSW is a revolutionary technology with outstanding advantages vs. conventional welding method: no melting of the base material, no flaws, no residual stress and no deformation. After successful applications in aerospace and military industry, FSW is extended to other industry areas.

Kinto is a partner of the licensed process in China. The unique possibilities of FSW enable us to produce liquid cooled heat sinks with outstanding performance.

Friction Stir Welding (FSW): joint with homogenous structure

Friction Stir Welding (FSW): equipment for working piece max length 2300mm, max width 1400mm and welding thickness 1~16mm.

Friction Stir Welding (FSW): in process in Kinto for making sealing of a heat sink

Heat sink after FSW sealing. The surface will be milled.
Material and Surface Treatment of Heat Sinks

The material for the heat sinks can be aluminum alloy or copper, with surface treatment anodizing or nickel-coating for aluminum and nickel-coating for copper.

Testing of Heat Sinks

With advanced testing equipment, we can make type tests and routine tests as following:

- X-Ray tester for checking welding quality. The max. penetration thickness of the X-ray is 60mm.

- Tightness test (leakage test)
  According to customers’ requirements, 6~20 bar will be applied for 10-24 hours, and then check the pressure loss.

- Performance Testing Center for making:
  - Flow resistance test
  - Thermal resistance test
  - Temperature-rise test under different power
  - Heat sink efficiency test
  - Simulation test of heat sinks for different application conditions

The trend towards higher power and more compact design is making liquid cooling a necessity in many applications such as high-power electronics, lasers, power drives, medical equipment, military and aerospace industries. KINTO supplies to customs liquid-cooled heat sinks / cold plates with high performance, high reliability and competitive price.
Examples of our heat sinks / cooling plates:

Copper heat sink, nickel-coated

Aluminum heat sink

Aluminum heat sink, nickel-coated

Copper heat sink, nickel-coated

Copper heat sink with dual-sided cooling capability

Aluminum heat sink, surface anodized

Aluminum heat sink