High-purity aluminum foils are used as electrode foils of aluminum electrolytic capacitors after surface enlargement treatment by customers, thus playing an essential role for electric and electronic products.

- **Refining technology**
  “Cojunal method” is a refining technology utilizing the segregated solidification principle, which we were the first in the world to commercialize successfully.
  Refining ability: 99.9% Al → 99.998% Al

- **Molten metal treatment technology**
  The “GBF method” is an excellent molten metal treatment technology, whereby inert gas is blown into molten metal as ultrafine bubbles to efficiently remove hydrogen and non-metal inclusions in the molten metal.

- **Organization control technology**
  In the case of, for example, high-voltage capacitor anode foil, since surface enlargement treatment is applied using cube orientation, cube texture control is needed.

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**Product Example**

![Basic structure of the element](Diagram)

**Our technologies**

![Etching photo of the non-cube orientation and cube orientation areas (Cross section)](Etching_photo)
Heat Exchangers

Product example

Refrigerator evaporator
- Evaporator for household/industrial use refrigerator-freezer

Industrial use oil cooler
- Lubricant oil cooler and compressed air cooler for various industrial machines

High-precision heat sink
- Heat sink for cooling control panels of various industrial machines

Our technologies

- The use of aluminum for all components minimizes weight.
- We own aluminum rolling/extruding technology.
- We can design excellent heat-exchange performance. (Highly heat-conductive oil circuit and cooling fin structure)
- We own junction technologies, such as welding and brazing. (Strength, airtightness)
- We use the potential difference of materials to achieve high-corrosion resistance in material design.
- We can perform integrated manufacturing from heat design and material production to assembly.
- We have the manufacturing ability to ensure no complaints arise in the market.
- We can design the structure and specifications suitable for the customer’s usage environment. (Hydrophilic surface treatment, low frost formation structure, etc.)

Examples of high-precision heat sinks

- Wide/light/thin
- Large size/low cost
- High design freedom
Product Example

Vehicle-installed inverter cooling device
- Direct cooling type cold plate

PCU (Power control unit)
- IGBT element

Vehicle-installed secondary battery cooling device
- Ceramic insulating substrate
- LiB battery
- RB (roll bond) panel aluminum

Water-cooled LLC or air conditioning cooling medium

Our technologies

- We own the technology of aluminum bulk brazing of the ceramic insulating substrate and the heat sink.
- We own aluminum forming technology, i.e., extrusion, rolling, forging, and press method.
- Down-sizing and space-saving can be achieved thanks to the improved performance.

- We own aluminum rolling/extrusion molding technologies.
- We own joining technologies, such as welding and brazing.
- Thin panels can save space.
- Either an internal fluid LLC or cooling medium can be used.
Track record of replacing iron parts with aluminum
(Swash plates, suspensions, brake pistons, etc.)
Track record of improving aluminum casting functionality
(Compressor pistons, engine pistons, etc.)
# Contact Us

<table>
<thead>
<tr>
<th>Products · Technologies</th>
<th>Inquiry of the products</th>
<th>TEL &amp; FAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-purity Aluminum Foil</td>
<td>Aluminum sheets group, Marketing department Aluminum Rolled Products Division</td>
<td>TEL : +81-3-5470-3546 FAX : +81-3-5470-3770</td>
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<tr>
<td></td>
<td>High purity aluminum various products</td>
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<tr>
<td>Heat Exchangers</td>
<td>Electrical &amp; Industrial Cooling Device Group, Cooling Device Marketing Department Aluminum Specialty Components Division</td>
<td>TEL : +81-3-5470-3302 FAX : +81-3-5470-3770</td>
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<tr>
<td></td>
<td>Skyve heat sink™</td>
<td></td>
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<tr>
<td>Automotive Cooling Devices</td>
<td>Automotive Cooling Device Group, Cooling Device Marketing Department Aluminum Specialty Components Division</td>
<td>TEL : +81-3-5470-3595 FAX : +81-3-5470-3775</td>
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<tr>
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<td>Cooling devices for power electronics installed in hybrid cars</td>
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<tr>
<td>Continuously-cast Rods</td>
<td>Shotic Group, Specialty Material Marketing Department Aluminum Specialty Components Division</td>
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<td>SHOTIC™</td>
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March 28, 2016 Rev. Corporate R&D Department Showa Denko K.K.

Ideas, hopes and dreams for your happily ever after.