





## Top message

### Team NLM—Groundbreaking Innovator of Aluminum and Beyond

Since its establishment, the NLM Group has been a comprehensive manufacturer of aluminum products with diverse offerings ranging from aluminum raw materials to fabricated products. Leveraging the Group's core strengths—highly original technologies for making the most of aluminum's properties and a wealth of knowledge and expertise amassed over the years—we supply highly diversified products for a wide range of industries.

We aim to be a corporate group that creates customer value as Team NLM by exercising the unique skills of Group companies possessing a wide range of knowledge and their members.

By integrating the strengths of Team NLM with value as it is seen by our customers and the world, and by sincerely and unflinchingly tackling challenges, we will contribute to the improvement of people's quality of life and environmental protection as a corporate entity that grows sustainably.

*I. Okamoto*

**Ichiro Okamoto**  
President and Chief Executive Officer

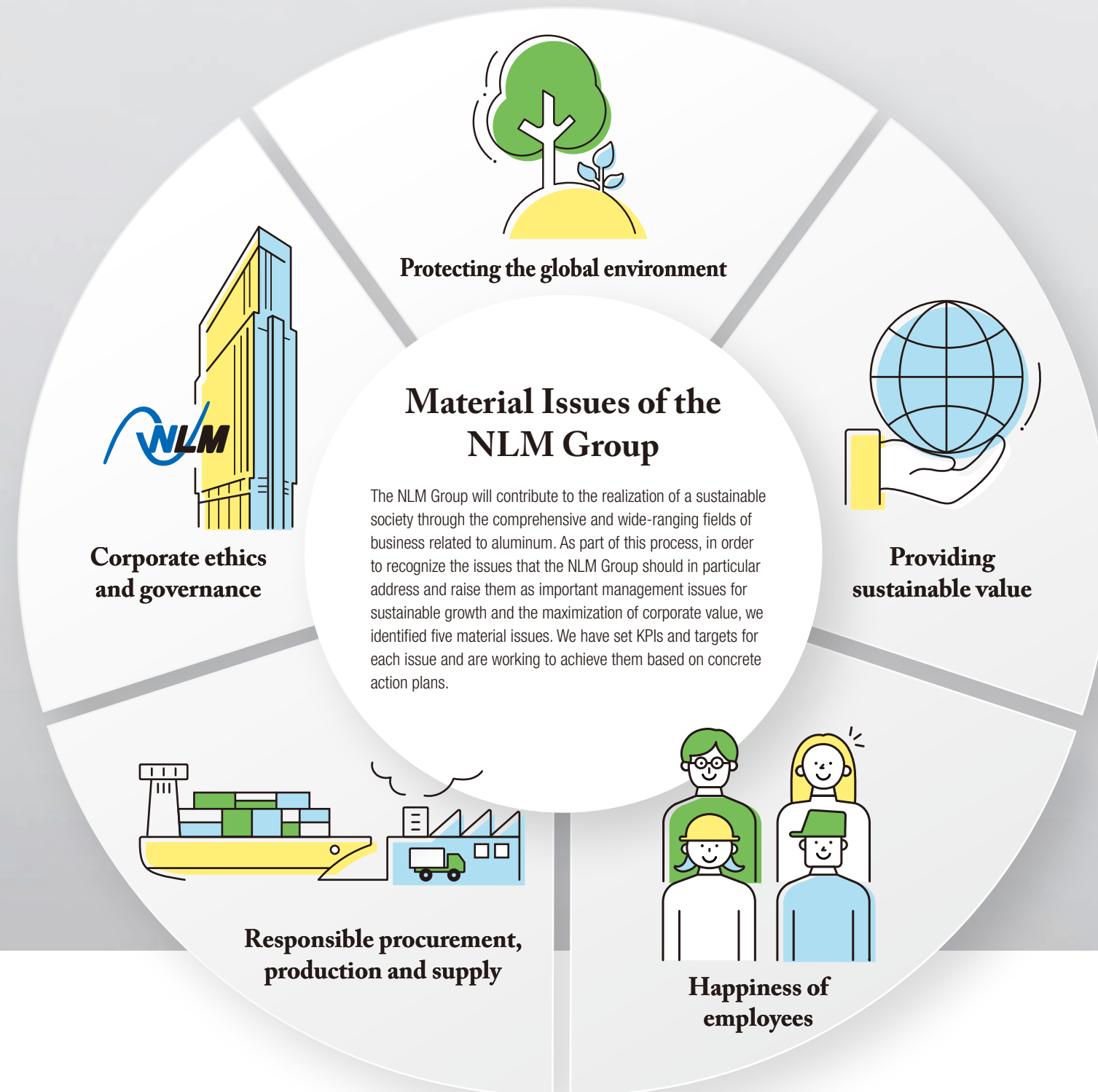
## NLM Group Management Policy

### Corporate Philosophy

**Contribute to improving people's quality of life and environmental protection by continuing to create business, focused on aluminum.**

### Basic Policies

- The Group will create healthy, safe workplaces, and achieve zero-accident operations.
- The Group will continuously provide diverse value to customers by deepening the level of collaboration and coordination within and outside the Group.
- The Group will work actively to achieve carbon neutrality, to help create a sustainable society.
- The Group will engage in fair and honest business operations, with respect for human rights and an emphasis on ethics.
- The Group will respect diverse values, and develop human resources from a long-term global perspective.



## Contents

### The Basis of the NLM Group's Total Solutions

- 1 NLM Group Business Sectors ..... P.3
- 2 Market Presence and Corporate Social Responsibility..... P.5
- 3 Superior Innovation ..... P.6

### Business Fields

- 1 Automobiles ..... P.7
- 2 Machinery, Electronics, and Communications ... P.9
- 3 Environment, Safety, and Energy ..... P.11
- 4 Public Works, Landscape, Construction ..... P.13
- 5 Transportation ..... P.15
- 6 Food, Health & Industrial Products ..... P.17

### Global Reach ..... P.19

### Corporate History / Corporate Profile ..... P.21

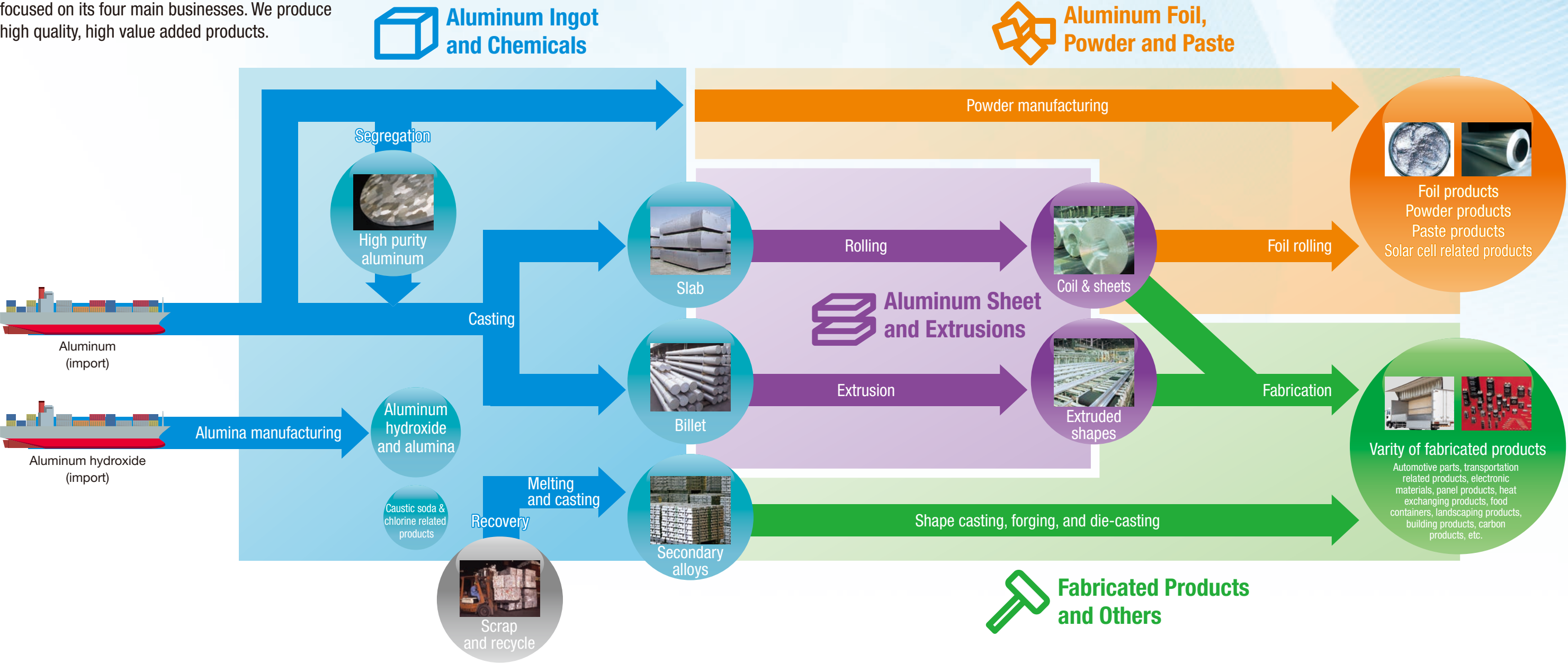
Information on the sustainability activities of the NLM Group is presented in detail on our website.



# 1 NLM Group Business Sectors

As a comprehensive manufacturer, the NLM Group provides total solutions, from aluminum materials to semi-manufactured and fully fabricated products.

As a comprehensive manufacturer, the NLM Group has established an aluminum production organization focused on its four main businesses. We produce high quality, high value added products.



## Aluminum Ingot and Chemicals

The NLM Group manufactures a wide variety of chemicals such as alumina and aluminum hydroxide used in aluminum raw materials such as flame retardants, ceramics, and grinding materials. In addition, we manufacture high purity aluminum and aluminum alloys at the highest levels of industrial production in the world.

## Aluminum Sheet and Extrusions

The NLM Group offers aluminum sheets and extrusions for a diverse range of fields, including transportation, machinery, and electronics. We are applying our advanced designs and structural analysis technology to create many high precision, high quality sheets, as well as highly complex-shaped, difficult-to-manufacture extrusions.

## Aluminum Foil, Powder and Paste

The NLM Group constantly pursues the full possibilities of aluminum through innovative research and high precision material fabrication technology. We also create multi-material products with resins, films, and other materials to offer a wide variety of high quality, high performance aluminum foils, powders, and pastes.

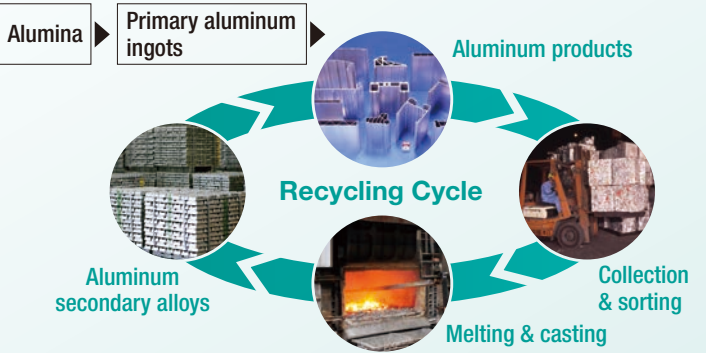
## Fabricated Products and Others

The NLM Group offers a wide variety of extremely reputable, fabricated aluminum products such as aluminum foil for electrolytic capacitors, automotive parts, landscaping products, and building materials, such as those used in van and truck bodies, commercial refrigerator and freezer panels, and clean room panels.

### Spotlight

#### Recycling Aluminum for a Sustainable Society

Compared to other metals, aluminum does not corrode very easily. Also, since it has a low melting point, it is very easy to melt for recycling. In fact, recycling aluminum is very energy efficient, taking only 3% of the energy needed to manufacture new aluminum ingots. We meet the need for recycled aluminum in various fields, particularly the automotive industry.



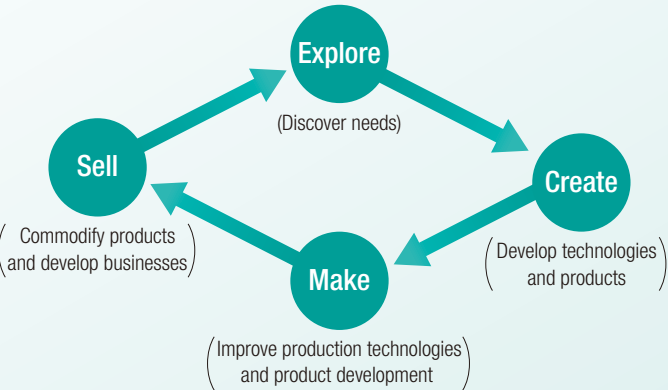


The NLM Group's Yokogushi Development Platform\*1 leverages the Group's comprehensive capacities to meet diverse customer needs.

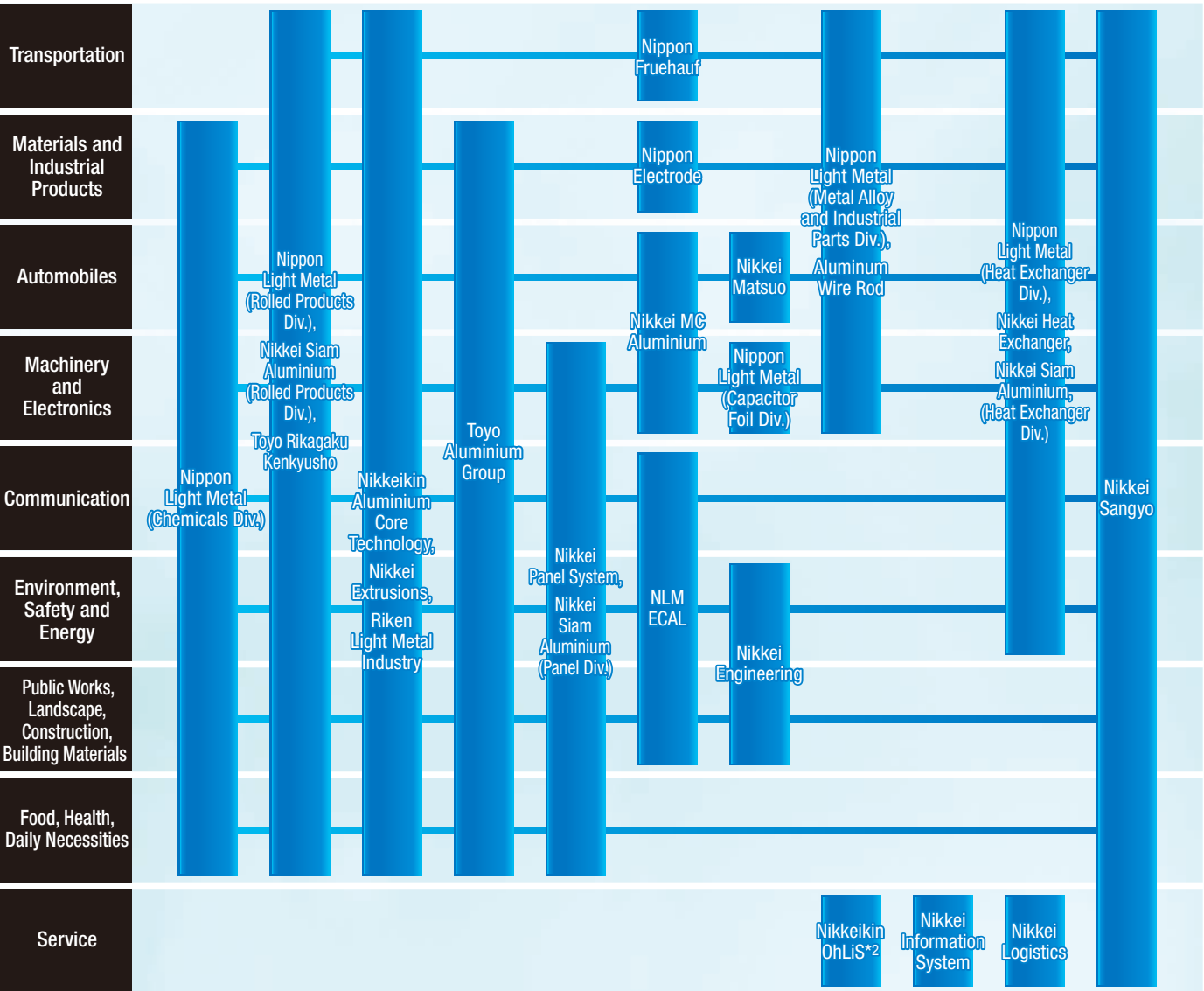
Spotlight

Yokogushi Development Platform facilitates a single team driving business development

All the Group's employees share a single mindset: "explore customer needs and then find the right solution." Based on that spirit, the NLM Group uses a workflow of "explore, create, make, and sell" to produce high value added products and services that are competitive in the marketplace.



\*1 Yokogushi Development Platform: A cross-functional platform for developing multifunctional products



\*2 Special Subsidiary Company

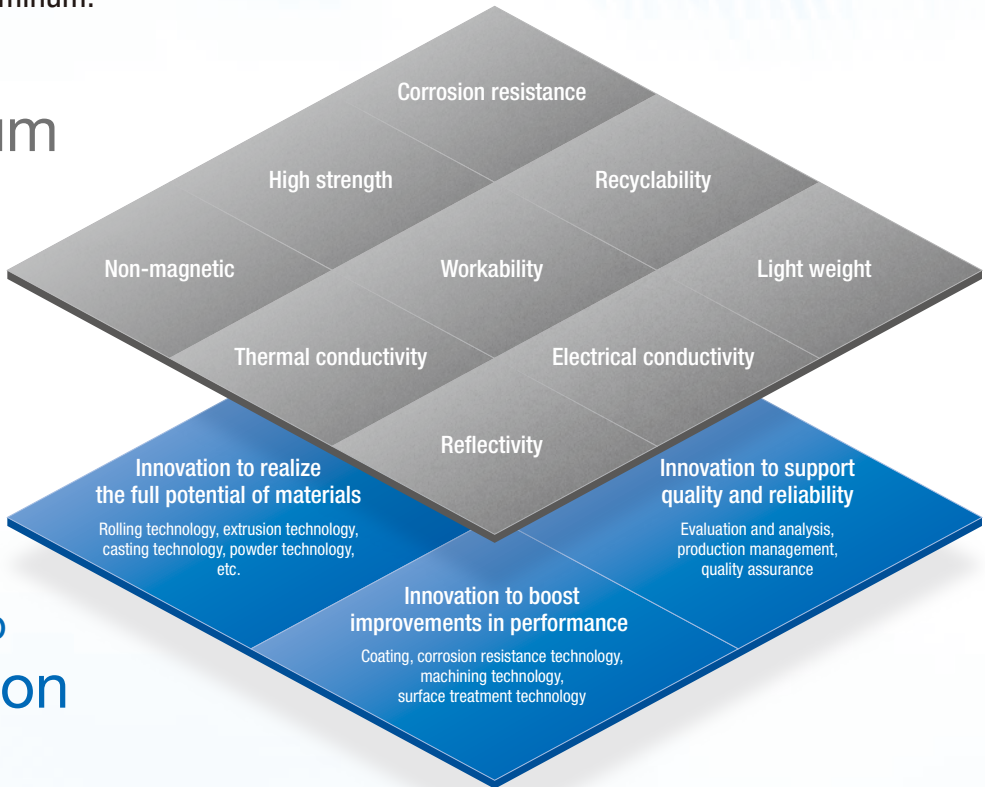
Leveraging technology and knowledge built up over the years, the NLM Group creates high value added products and services.

The NLM Group seeks to create one-of-a-kind value by multiplying its culture of innovation with the fundamental value of aluminum.

Aluminum  
Value



NLM Group  
Innovation



Advanced R&D Centers

With its various R&D centers leading the way, the NLM Group enthusiastically welcomes the challenge of creating new value.

Nippon Light Metal Company  
Nikkei Research and Development Center

This is the overall NLM Group R&D center that supports horizontally integrated development by effectively applying the innovative technologies possessed by each group company. This center is focused on realizing products that meet customer needs to create new business opportunities.

Nippon Light Metal Company  
Shimizu Plant, Kambara Chemical Plant

This company does chemical R&D directly at its plants. The Shimizu Plant is equipped with the highest level of aluminum hydroxide related technology in Japan, enabling speedy development. The Kambara Chemical Plant works on new product development such as caustic sodas, all varieties of inorganic compounds, and chlorinated organic compounds.

Toyo Aluminium  
Core Technology Center

The Core Technology Center conducts research and development of new technologies and new products for the creation of new business. The Technical Solution Center provides services for the commercialization of R&D products. As the core of the Toyo Aluminium R&D organization, these two research departments strive to develop unique technology and products.



If you ever want a small consultation on making a prototype or implementing a development plan, or wish to request testing, inspection, and so forth, first try **Shisaku.com**. (in Japanese only)

Spotlight

Hydroelectric Power to Support Business Activities

The Nippon Light Metal Company utilizes the strong current of the Fuji River with two dams and six power plants to provide stable power to its Kambara Complex. The total amount of power generated is 144,500 kW, making it possible to supply most of the power needs of the complex.



# Automobiles

The NLM Group leverages its know-how and comprehensive group capacities as a fully integrated aluminum manufacturer to solve multilayered, multifaceted problems.

Electrical and Electronic Components

Aluminum harnesses, water chillers for cooling power modules, heat sinks for LED headlights, etc.

Gas Pedals, Brakes

Brake caliper bodies, etc.

Climate Controls

Parallel flow sub-cooled condensers for automobile HVACs, etc.

Body Structure and Exterior Components

Bumper reinforcement, etc.

Interior Components

Seat slide rails, etc.

Paint

Aluminum paste, etc.

Power Controller Unit

Aluminum nitride powder, etc.

Engine & Powertrain

Engine mount brackets, intercooler pipes, etc.

Suspension & Wheels

Suspension components, etc.

Bumper reinforcement

Seat slide rail

Engine mount bracket

Intercooler pipe

Heat sinks for LED headlights

Water chillers for cooling power modules

Cooling plate for automotive lithium-ion batteries

## »Solutions

Making the most of comprehensive Group capacities to find solutions to advanced problems in automobile development

NLM Group

In recent years, developed countries have further strengthened CO2 emission regulations, which in turn has increased the need for weight reduction of automobiles. As such, aluminum has been highlighted as an ideal solution for achieving weight reduction since it has one third the specific gravity of steel and copper.

In these market conditions, the NLM Group has been leveraging its integrated system spanning materials, manufacturing, design, and evaluation to provide products that are optimized for the needs of its customers.

Materials

Alloy development

Evaluation

Testing, analysis, evaluation

Manufacturing

Differentiated manufacturing methods, assembly

Design

CAE

Total Supplier

Total coverage

## »Solutions

Contributing to eco-friendly vehicles spreading around the world and the protection of planet with the NLM Group’s thermal solutions

Nippon Light Metal (Heat Exchanger Div.)	Nikkeikin ACT
Nippon Light Metal (Metal Alloy & Industrial Parts Div.)	Nippon Light Metal (Chemicals Div.)
Nikkei Matsuo	Toyo Aluminium

Working toward a decarbonized society, the world of mobility is seeing a trend toward xEVs and the new value of transportation means plus services such as CASE and MaaS, with the required functions and performance evolving to a higher level. Given this context, one of the key technologies to ensure the proper operation and safe use of key components such as inverters, motors, and batteries, which are essential for xEVs, is thermal countermeasures. The NLM Group, as a professional aluminum manufacturer, will continue to provide optimal thermal solutions that satisfy our customers, thereby contributing to the protection of the global environment, by combining our long track record in the use of automotive cooling components with our aluminum-related materials, processing, and bonding technologies, as well as our analysis and design capabilities.

## »Products

For Sensors, Honeycomb, Plugs

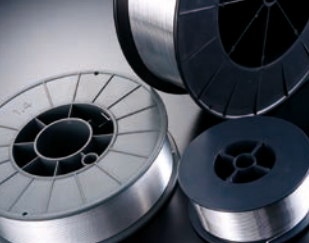


Alumina for ceramic materials

Nippon Light Metal (Chemicals Div.)

Alumina created using powder manufacturing technology that enables tailoring for the necessary properties for ceramic applications

For Wire Harnesses



Aluminum wire harnesses for automobiles

Nippon Light Metal (Metal Alloy & Industrial Parts Div.)

Aluminum alloy wires with superior strength and bend tolerance to meet the need for weight reduction to improve fuel efficiency

For Suspensions



Suspension components

Nikkeikin ACT

Each component's shape is designed and tested using optimized methods for manufacturing in terms of material selection as well as developed alloys, extrusion, and forging

For Brakes



Brake caliper bodies

Nippon Light Metal (Metal Alloy & Industrial Parts Div.)

Integrated caliper body castings using original technology employing aluminum pipe inset casting

For Sunroof Guiderails



Sunroof guiderail materials

Nikkeikin ACT

Superior products in terms of quality and cost competitiveness, used in a wide variety of automobiles throughout Japan, Europe, China, and North America

For Paint



Metallic pigment Alpaste®

Toyo Aluminium

Aluminum pigments with coin-shaped particles for a smooth surface, with high design functionality, used as the topcoat for automobiles

For Engine & Drivetrain Systems



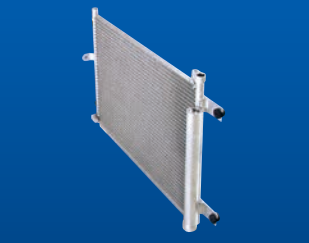
Abrasion resistance aluminum alloy NH41

Nikkei MC Aluminium

Aluminum alloys that are easy to handle and have abrasion resistance, which can reduce operating costs in the manufacturing of components

An example of processing by one of our clients

For HVACs



IPFC (parallel flow sub cooled condensers) for automobile HVACs

Nippon Light Metal (Heat Exchanger Div.)

Nikkei Heat Exchanger

All aluminum condensers with superior thermal conductivity, strength and corrosion resistance due to original aluminum material development

### Spotlight

Adoption of the Unique Fabrication Process of FLEXCASTER™ to Transform Liquid Aluminum Directly into Sheet

Nippon Light Metal (Rolled Products Div.)

FLEXCASTER™ is a leading edge, high volume, continuous casting technology which can transform liquid aluminum into high quality coils of thin sheet in a single operation. Compared to the conventional method using the same chemical composition, this new method achieves 15% more strength and the same level of deep drawing performance as steel.

Automobile hood inner material (plate material made using FLEXCASTER™)



Development of Plate for PCU with FSW Bonding of High-Quality Diecast Products and High Heat Dissipation Fins

Nikkei Matsuo

A heat dissipation plate was developed by combining NLM Group's original pore-free die casting technology and FSW bonding technology. It began to be adopted and installed in 2020 as one of the power control unit (PCU) components for electric vehicles. Adopting the FSW bonding method in place of conventional bolt fastening method to mount the fin contributes greatly to downsizing. This new plate has been warmly welcomed by customers as an excellent product.

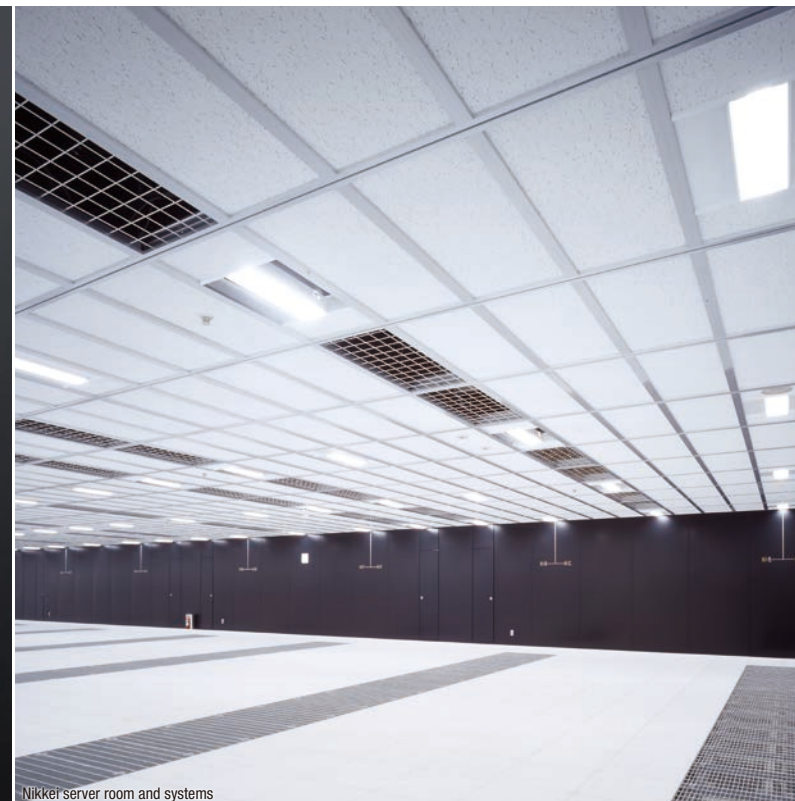
Base plate for electric vehicle PCU (green frame is the FSW bond)





# Machinery, Electronics, and Communications

Since aluminum is superior due to its light weight, thermal conductivity, electrical conductivity, and strength, the demand for it is ever increasing as products continue to evolve and become more advanced.



Nikkei server room and systems

## » Solutions

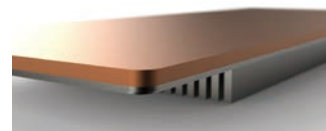
### Offering new solutions for thermal countermeasures with “Aluminum + 1” multi-materials

Nippon Light Metal (Rolled Products Div.)	Nikkeikin ACT	Nippon Light Metal (Heat Exchanger Div.)
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The importance of thermal management has been increasing rapidly as electronic devices in various fields have become more sophisticated in recent years. In line with this trend, customers' needs for thermal countermeasures have been diversifying, and we are facing issues that cannot be solved by using only a single material. The NLM Group is committed to creating multi-materials that fit customers' needs through fusion of aluminum with other materials such as resin and copper, while taking advantage of the characteristics of aluminum. Continuing to pursue new synergies that emerge from the fusion of these materials, we are engaged in the research and development of new solutions for the next generation.



Aluminum/resin bonding: Cooler



Dissimilar metal bonding: Heat sink

## » Solutions

### Supporting equipment for the information networks that are indispensable to society

Nikkeikin ACT	Nikkei Panel System	NLM ECAL
Nikkei Sangyo		

The NLM Group supports the environmental equipment used for information networks by designing and delivering communication-related products that are lightweight, rigid, and have other necessary characteristics.



Mobile phone base station



Nikkei server room and systems



Aluminum double flooring

## » Products

### For Electronics



#### Etching circuit foil for IC cards

Toyo Aluminium

Etching circuit foil that provides high functionality to contactless banking and public transportation IC cards

### For Electronics



#### Aluminum electrolytic capacitors

Nippon Light Metal (Capacitor Foil Div.)

Aluminum electrolytic foil, which is the main material in aluminum electrolytic capacitors, jointly developed with Japan Capacitor Industrial Co., Ltd., the top manufacturer in the field of capacitors

### For Mobile Devices



#### High quality anodized sheets

Nippon Light Metal (Rolled Products Div.)

Anodized sheets with a non-yellowing color tone and a very high level of quality that is so stable that it dramatically improves yield rate

### For Mobile Devices

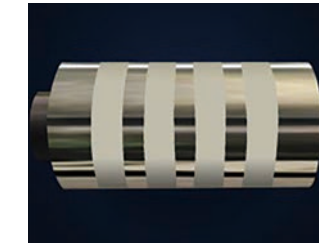


#### High purity alumina for sapphire boards

Nippon Light Metal (Chemicals Div.)

High purity alumina lineup made by improving the refining process of alumina as much as possible, for applications including LED boards and mobile phone cover glass

### For Electronics

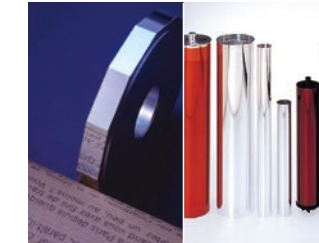


#### Powder laminated foil

Toyo Aluminium

A laminated material created by sintering aluminum foil and powder together to form a porous body with a large amount of surface area

### For Digital Office Automation Equipment



#### Polygon mirrors & photoreceptor drums

Nikkeikin ACT

Cutting tubes for high precision photoreceptor drums and materials for polygon mirrors used to realize the high reflectivity needed in laser printers and other digital office automation equipment

### For Electronics



#### High conductivity plate material and components

Nippon Light Metal (Rolled Products Div.)

A full lineup of products to meet the demand for conductivity and strength, available in various made-to-order surface treatments (plating, conductive grease application) to reduce contact resistance

### For Mobile Devices



#### Photoluminescent alumite die-cast alloys

Nikkei MC Aluminium

Beautifully colored die-cast aluminum alloys produced using anodizing

## Spotlight

### PAL-fit®, a bonding technology that integrates metal and resin

Nippon Light Metal (Rolled Products Div.)

Bonding with adhesive and mechanical bonding with screws are widely used as bonding methods to integrate metal and resin. However, the NLM Group's original resin bonding metal surface treatment, PAL-fit®, provides strong and uniform bonding of metal and resin exhibiting excellent bonding strength and airtightness. PAL-fit® makes it possible to produce hybrid parts in which metal and resin are tightly bonded.

### Aluminum with the Highest Level Purity in the World

Nippon Light Metal

The NLM Group produces high purity aluminum at the world-class 6N level (99.9999% pure) using industrial production techniques to meet a variety of customer needs.



High purity aluminum



# Environment, Safety, and Energy

The NLM Group contributes to safety and preservation of the environment in a variety of ways using its group-wide technical development capacities to make the most of the innate characteristics of aluminum in environmental applications.

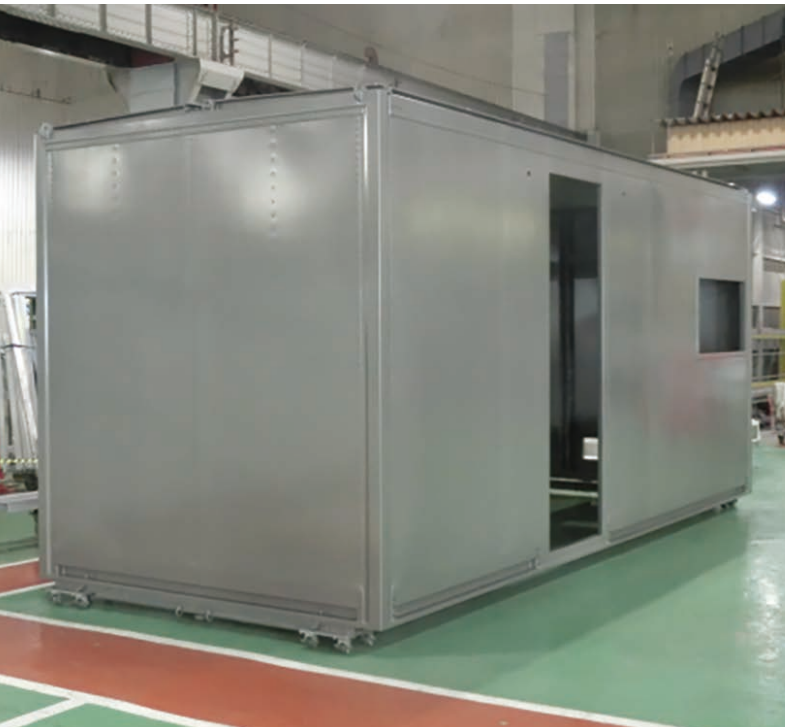


Photo provided by NAC International



Photo provided by ORANO TN International



Photo provided by ORANO TN International

## » Solutions

**Portable IT container to protect precision machinery from Earth's harsh environments**

NLM ECAL	Toyo Aluminium
Nikkei Panel System	Nippon Light Metal

The use of IoT and AI is advancing rapidly, and many kinds of precision equipment, including digital and telecommunications equipment, now play an important role globally. The portable IT container developed by the NLM Group is winning praise as an outer shell for all kinds of precision equipment installed in areas of extreme heat and cold, desert, heavy salt damage, and strong UV.

### ● Extreme environment features

(1) Outside temperature blocking  $\pm 40^{\circ}\text{C}$  (2) Weather resistance (heavy salt damage, high humidity, UV) (3) Abrasion resistance (sandblasting) (4) Electromagnetic wave shielding (attenuation of approximately 40db up to GHz band) (5) Long-term durability (5  $\times$  life of normal coating) (6) Evacuation support (portable)

## » Solutions

**Leveraging know-how amassed by the NLM Group to provide aluminum materials for hydrogen accumulators with a high level of strength and corrosion resistance**

Nikkeikin ACT	Nippon Light Metal
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Until now, hydrogen accumulators used for hydrogen stations and other purposes have been primarily made of iron. However, with the growing demand for hydrogen, needs have diversified, including ease of installation and cost reduction through weight reduction, and demand for mobile as well as stationary accumulators. Using the alloy development, casting, and extrusion technologies it has amassed over many years, the NLM Group has developed a high-strength 6000-series extruded tube meeting high levels of strength and corrosion resistance after processing, furthering development of a hydrogen society.



Aluminum material for hydrogen accumulators

## » Solutions

**MAXUS® and NEXUS-3000® neutron absorber materials for both spent fuel pool racks and dry storage casks**

Nikkeikin ACT	Nippon Light Metal	Toyo Aluminium
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MAXUS® and NEXUS-3000® are MMC materials created by mixing aluminum powder with boron carbide powder, which absorbs neutrons. Mass production of these high-performance materials was made possible by the collective knowledge and know-how of each NLM division and the powder technology of Toyo Aluminium. These products meet customers' expectations because we produce Al-B4C MMC materials with the neutron absorption capacity required for spent fuel pool racks and dry cask baskets.

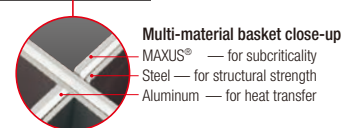
**MAXUS®**  
**NEXUS-3000®**

### ● Images of dry cask baskets

Multi-material basket  
MAXUS®, steel & aluminum

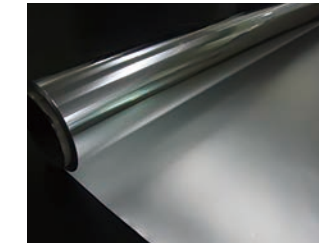


Single material basket  
NEXUS-3000®



## » Products

### For LIB laminated pouch foil



#### TY-X2 (battery exterior foil)

Toyo Aluminium

TY-X2 is the optimal aluminum foil for use as an exterior material for lithium-ion battery laminated pouches. We have the industry's number-one track record with world-class, outstanding moldability, residual oil management, and pH management

### For Anodizing Factories and Printing Plate Factories



#### Alkali collection device

Nikkei Sangyo

A device that separates caustic soda and crystalline aluminum hydroxide from the caustic waste that results during the etching process of aluminum surface treatment so that those substances can be reused

### For Disaster Prevention Equipment



#### Disaster prevention storage shed

NLM ECAL

Disaster prevention storage sheds that are very reliable for long-term storage of physical goods, including some solar-powered models

### For Seismic Motion Control



#### BRACEREE Type K

Nikkeikin ACT

Brace equipped with an aluminum device that converts seismic energy into heat with high damping performance, with a new structure that efficiently transfers energy to reduce shaking of wood homes in seismic events

### For Solar Cells



#### Hane™ Module

Toyo Aluminium

A solar cell module that is half the weight but delivers the same performance as conventional ones, which can be installed in difficult places like rooftops of plants and warehouse, carports, walls of buildings and large facilities

### For Disaster Prevention Equipment



#### Water supply tank

Nikkeikin ACT

A water supply container used for water during disasters, foldable for improved storability and very hygienic with the use of an inner lining

### For Soil



#### Aluminum chloride hexahydrate

Nippon Light Metal (Chemicals Div.)

Aluminum chloride hexahydrate for spreading on soil to control the soil's acidity

### For Crisis Management Measures



#### Flood and water gates

Nikkei Engineering

Flood and water gates made from an aluminum alloy that is lightweight, facilitates easy operation, and offers good corrosion resistance, used to protect lives and property

## Spotlight

### Nikkei Ecolas: Chrome-Free Colored Aluminum for Better Health and a Cleaner Environment

Nippon Light Metal (Rolled Products Div.)

Up until now, processing agents such as hexavalent chromium have been used in the pretreatment stages of paint. However, since it became known that hexavalent chromium is highly toxic, world regulations have been enacted to restrict its usage.

In response, the NLM Group developed Nikkei Ecolas, a chrome-free colored aluminum which complies with ELV, WEEE, RoHS, and other such standards, and completely avoids the use of chrome, lead, and other materials and agents that negatively impact the environment.



Nikkei Ecolas, used on a truck

### Aluminum Microchannel Freezing Pipes Used in Underground Infrastructure Construction

Nikkei Sangyo

The technique of ground freezing may be used to construct underground structures such as subways, sewers, underground tunnels for highways, and underground floors of station buildings. Unlike the method of hardening the ground with concrete and chemical agents, ground freezing is said to be an environmentally friendly method because it thaws after construction ends and leaves no waste. Heat exchangers with brazed joints at both ends of aluminum flat tubes made by Nikkei Sangyo are called "aluminum microchannel freezing pipe," and are often used in this ground freezing technique.

#### ● Microchannel freezing pipe

The ground is frozen to prevent it collapsing, and then widening work, etc. is carried out.



Affixed to the inner wall of the excavation site

Frozen excavation site



# Public Works, Landscape, Construction

The NLM Group contributes to better energy savings and durability in safe, secure, and comfortable spaces for everyday life, which feature both excellent product function and superior design.



## »Solutions

Creating a comfortable sound environment with ALMISSIMO, an aluminum sound absorbing material that controls air vibration through resonance

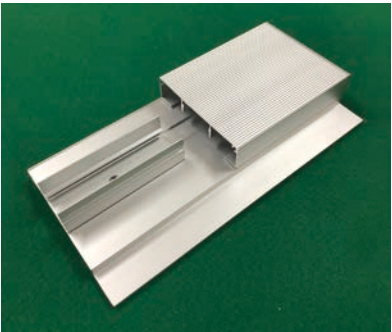
Riken Light Metal Industry

Nippon Light Metal

ALMISSIMO is an aluminum interior finishing material incorporating the structure of a Helmholtz resonator. The reverberation of sound can be adjusted to provide a comfortable aural environment. With all the elements needed in a finishing material—sound absorption, incombustibility, lightweight, design qualities—ALMISSIMO can be used in a variety of spaces, including station buildings, libraries, and educational facilities.

### ●Features of ALMISSIMO

Sound absorption	Incombustibility	Lightweight	Design qualities
<ul style="list-style-type: none"> <li>Finishing material using the structure of the Helmholtz resonator, enabling sound absorption</li> <li>Sound absorbing material composed solely of aluminum, without a backing material such as glass wool</li> </ul>	<ul style="list-style-type: none"> <li>Essential for finishing materials in locations where an unspecified number of people gather</li> <li>Individual non-combustible material certification [NM-3348]</li> </ul>	<ul style="list-style-type: none"> <li>Lightweight, as it is entirely aluminum</li> <li>Compatible with "Specifications Route" for Specified Ceilings in Ministry of Land, Infrastructure, Transport and Tourism Notice No. 771</li> </ul>	<ul style="list-style-type: none"> <li>A wide variety of colors can be freely combined to produce the desired space.</li> </ul>



Cross-sectional surface of ALMISSIMO

## »Products

### For Shaping Public Spaces



#### Train station complexes

Nikkei Engineering

Builds space-shaping solutions for train station areas such as plazas, open passages, and pedestrian decks, helping to create comfortable, human-friendly spaces that harmonize with their surroundings

### For Paint



#### Stenshel® (stainless steel flake-containing paint)

Toyo Aluminium

Paint incorporating high-quality stainless steel flakes to create a tough coating that is highly durable and very rust-resistance; can help reduce the overall painting process, saving both time and money in construction

### For Refrigerators/Freezers (commercial)



#### Thermal insulation panels for refrigerators and freezers

Nikkei Panel System

Panel systems for refrigerators and freezers that enable precise temperature control and meet the needs of HACCP and the globalization of food distribution

### For Buildings (interior and exterior design)

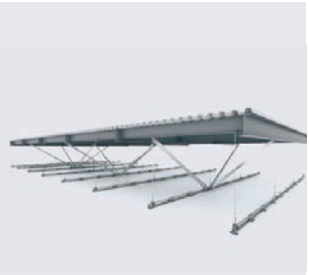


#### Interior/exterior louvers

Riken Light Metal Industry

A lineup of a wide array of design louvers for use as blinders, light shielding, ventilation, and even construction design

### For Buildings (ceilings)



#### NEQRES series of quakeproof ceilings

Nikkei Panel System

Ceilings using compression braces that deliver twice the design bearing force of conventional braces, resulting in lower brace volume and material costs and more effective use of ceiling space

### For Crisis Management Measures



#### Movable aluminum water purification plant cover

Nikkei Engineering

Aluminum water purification plant covers which ensure reliability, safety and security for local infrastructure and protect waterworks from water pollution risks (foreign matter contamination, terrorism, natural disasters)

### Spotlight

#### GENESTA Incombustible®: CFC-Free Thermal Insulated, Incombustible Panels Designed for Environmental Performance

Nikkei Panel System

GENESTA Incombustible® is a CFC-free, thermal insulated panel that is environmentally friendly because it has zero negative impact on the ozone layer and almost no negative impact on global warming. The panel is the result of a world-first application\*1 of HFO.\*2 It has great environmental performance, is certified as a fire prevention material, and meets the needs of food plants, refrigerators, and freezers.



\*1: World's first application for injected foam metal sandwich panels (Source: Nikkei Panel Systems' research)  
\*2: HFO (hydrofluoroolefin)

GENESTA Incombustible® in use at a food processing plant

#### Cusa® Aluminum Alloy Permanent Scaffolding Extends Bridge Life and Reduces Maintenance Demands on Bridge Managers

Nikkei Engineering

Cusa® is a permanent scaffold that enables girder inspection (close visual inspection) and repair without traffic restrictions. It installs on girders that are difficult to inspect, such as at overpasses and pedestrian bridges.

- Features
- Improved workability for close-up visual inspection of bridges
  - Measures to prevent salt damage to the bridge body
  - Can be used as a work scaffold during repair
  - Installed by advancing from inside the scaffolding
  - Prevention of third-party damage outside the bridge

This product was jointly developed by Yokogawa Bridge Corp. and Nikkei Engineering Co., Ltd.



Installation under a passage girder at Takanawa Gateway Station

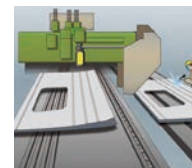


# Transportation

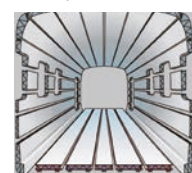
The NLM Group is focused on developing products that make the most of the properties of aluminum with the Group's original fabrication technology to meet needs in many transportation fields, including *shinkansen* bullet trains.



Provided (cooperation) by JR Tokai



Side body structure fabrication



Train body material (large extrusion shape)



Side covers



Interior materials

## » Solutions

### Developing technologies to contribute to improvement of both the environmental performance and comfort of trains

Nikkeikin ACT

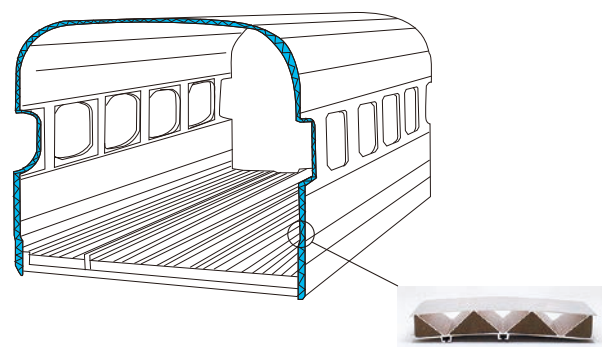
Nippon Light Metal (Rolled Products Div.)

In order to support the high speeds at which today's bullet trains travel, the materials used have to be both light and strong. In response, the NLM Group uses some of the best large-scale, hollow extrusion manufacturing technology in Japan to develop and manufacture aluminum alloy double skin structural material that is both light and very strong, used for the backbone. This double skin structural material has a truss shape section formed using a combination of triangular shapes.

Our solution has been adopted for the Tokaido, Sanyo, Tohoku, and Hokuriku *Shinkansen* bullet train lines. Our original technology and know-how has also contributed to the realization of all aluminum cars for some trains on other lines.



High precision extrusion technology



Aluminum alloy double skin structural material

## » Products

### For Freight Transportation



#### Dry vans

Nippon Fruehauf

A wide range of dry vans, from large to small, all watertight and efficient for carrying and handling

### For Freight Transportation



#### Temperature controlled vans

Nippon Fruehauf

A lineup of temperature-controlled vans with environmentally-friendly properties (CFC-free, thermal insulating materials)

### For Freight Transportation



#### Containers

Nippon Fruehauf

Containers that meet the needs of the modal shift to train and other freight transport systems

### For Freight Transportation



#### Hinged drop sides for loading

Nikkeikin ACT

Enclosures for preventing objects from falling off the bed of the truck; featuring hinged drop sides that are very strong, light and durable so that truck beds can be widely used; can be installed on wing roof vehicles, as well

### For Transportation

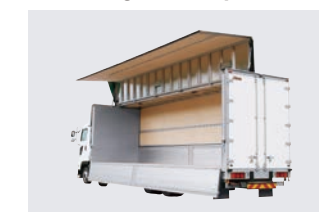


#### Aluminum bridges

Nikkeikin ACT

Made from high strength aluminum alloy for welding, light and very strong to support the loading and unloading of construction and agricultural machinery

### For Freight Transportation



#### Wing roof

Nippon Fruehauf

Wing roof perfect for large items due to high handling efficiency

### For Freight Transportation



#### Trailers

Nippon Fruehauf

A full lineup of everything from van trailers to container chassis, as well as wing trailers to full trailers

### For Freight Transportation



#### Power-saving devices

Nippon Fruehauf

Tailgate lifters and various other power-saving devices that improve the efficiency of cargo handling work

### For Transportation



#### Air roll

Nikkeikin ACT

Air roll for labor savings with pallet handling work. It is an environmentally superior product because of the air drive and is also used for delivery of pharmaceuticals.

### For Cargo Handling & Transportation



#### Aluminum pallets

Nikkeikin ACT

Aluminum pallets that do not build up static electricity and are very sanitary, used in a wide variety of logistics fields

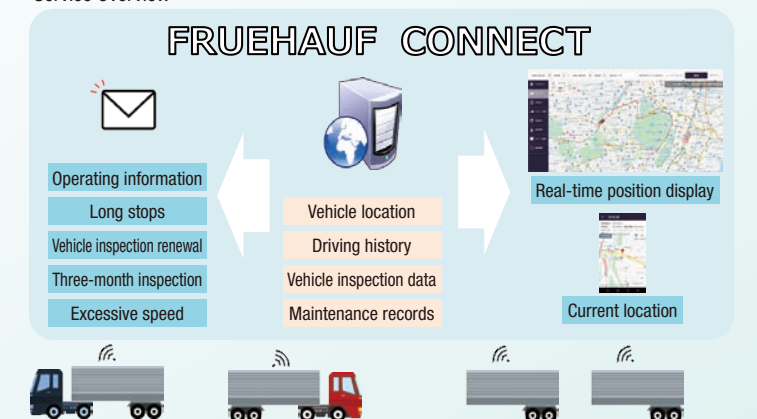
## Spotlight

### Launched FRUEHAUF CONNECT, a new service utilizing IoT technology

Nippon Fruehauf

Nippon Fruehauf has launched FRUEHAUF CONNECT, a new service that utilizes IoT technology, and as its first product, a Trailer Location Management System that allows users to check the location of trailers. Using this system, the location information of trailers can be easily accessed, and the data can be viewed and downloaded in real time on PCs and smartphones via an Internet connection. In addition to location information management, we will continue to develop FRUEHAUF CONNECT services that utilize IoT technology to provide even more value to customers, such as obtaining information on trailer condition as well as trailer and truck bed operation.

#### Service Overview





# Food, Health & Industrial Products

The NLM Group offers customer-oriented product ideas that are helpful in daily life for food, health, and industrial fields. These products are made from highly functional materials and are designed with full consideration for the environment.



## » Products

### For Pharmaceuticals



#### READ-MAX®

Toyo Aluminium

Aluminum foil for pharmaceutical tablet packaging that can be read by bar code readers without requiring the customary white background

### For Food



#### Aluminum can and dispenser cleaning can

Nippon Light Metal (Container Div.)

Originally developed large three-liter beer cans manufactured using drawing and ironing techniques

### For Food



#### Thermal insulated panels for food processing plants

Nikkei Panel System

Non-flammable, high thermal insulated panels that reduce the risk of contamination and cross-contamination

### For Various Industries

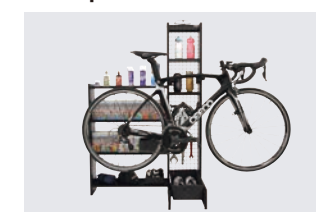


#### Industrial oxidizer

Nippon Light Metal (Chemicals Div.)

The first in the world to industrialize solid sodium hypochlorite, which is mainly used as an oxidizing agent in organic synthesis reactions

### For Sports



#### Cycle shelf

Riken Light Metal Industry

An aluminum shelf for indoor storing and exhibiting sports bicycles such as road bikes without leaning it against a wall or placing it directly on the floor. Simple maintenance is also possible, and cycling items can be stored in the rack part.

### For Food, Medical & Industrial Materials



#### TOYAL LOTUS® water-repellent packaging

Toyo Aluminium

Developed originally for the inside of yogurt container lids to keep the yogurt from sticking to the lid; expanding into other applications

### For Protection and immobilization of fracture sites



#### THERMAL GIPS® (For wrists)

Toyo Aluminium

Cast bandage for immobilizing a wrist fracture or sprain, etc. The thermoplastic inner splint softens when microwaved briefly, and hardens over time. No water needed. Saves time and makes treatment easier.

### For Cosmetics

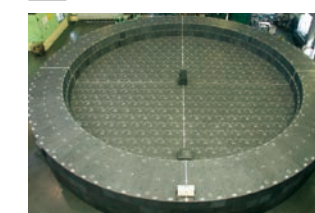


#### Cosmicolor®: Aluminum pigment with interference color

Toyo Aluminium

Pigment in which the reflection of light from the plating layer and aluminum flakes interfere with each other to make the hue change with the angle of view

### For Industrial Goods

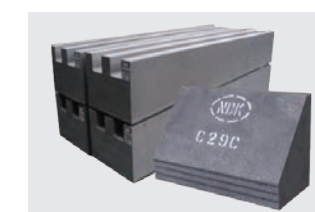


#### Carbon blocks for blast furnaces

Nippon Electrode

The No.1 brand in the world thanks to high quality, high precision and a long life of over 20 years, used worldwide in large blast furnaces

### For Industrial Goods



#### Cathode blocks

Nippon Electrode

In recent years, electrolytic furnaces require high-quality products that contribute to their long life and high efficiency. We provide quality products from our diverse lineup and develop new ones to meet customer needs.

## Spotlight

### Light, Easy-to-Carry, Easy-to-Assemble Aluminum Cycle Stand for Sport Bicycles

Riken Light Metal Industry

This aluminum cycle stand is light and easy to assemble. It is adjustable from 1,150 mm to 1,700 mm, making it possible to hold up to five bicycles. Great for convenience stores, bicycle shops, coffee shops along cycling paths, race venues, ride event venues, hotels, etc. It also folds and comes with an exclusive storage bag, making it easy to carry.



### NLM Group Products Playing an Active Role in the Field of Sports

Nikkeikin ACT

NLM Group products play an important role in many different fields of activity, including the sports field. At the 2002 FIFA World Cup soccer tournament, jointly hosted by Japan and South Korea, seven of the ten stadiums used soccer goals made by Nikkeikin ACT. In recent years, the NLM Group has also been offering alloys developed for use in baseball bats.



### Graphitization of Lithium-Ion Battery Negative Electrode Material in Continuous Vertical Graphitization Furnace

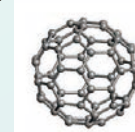
Nippon Electrode

The graphitization process, which is essential for the production of lithium-ion battery negative electrode material, achieves power savings and shorter production lead time with our unique continuous heat treatment technology. In addition to its economic benefits, it contributes to reducing environmental impact.

### Development of Carbon Electrodes from 100% Natural Raw Materials

Nippon Electrode

Nippon Electrode has developed carbon electrodes made from environmentally friendly, 100% natural raw materials. Recognized for their high sublimation efficiency and sustainability, they are used in fullerene manufacturing by the arc discharge method. Fullerenes are substances with a soccer ball-like crystal structure. They have a high antioxidant effect and are widely used as raw materials for cosmetics.



Molecular structure of Fullerene C<sub>60</sub>



Asia

Shandong Conglin Fruehauf Automobile Co., Ltd.

Nikkei (Shanghai) International Trading Co., Ltd.

Toyo Aluminium International Trading (Shanghai) Co., Ltd.

Nikkei (Suzhou) Precision Parts Co., Ltd.

Suzhou Toyo Aluminium Ekco Household Products Co., Ltd.

Toyo Aluminium Ekco Trading (Suzhou) Co., Ltd.

Nikkei MC Aluminum (Kunshan) Co., Ltd.

Changchun Nikkei Railway Vehicle Equipment Co., Ltd.

Hunan Ningxiang JiWeiXin Metal Powder Co., Ltd.

Toyal Zhaoqing Co., Ltd.

Nonfemet International Aluminium Co., Ltd.

NI Nikkei Shenzhen Co., Ltd.

Sam-A Aluminium Co., Ltd.

CMR Nikkei India Pvt. Ltd.

Toyal MMP India Pvt. Ltd.

Svam Packaging Industries Pvt. Ltd.

Nikkei Siam Aluminium Ltd.

Fruehauf Mahajak Co., Ltd.

Nikkei MC Aluminum (Thailand) Co., Ltd.

Toyal (Thailand) Co., Ltd.

Nikkei Panel System Vietnam Co., Ltd.

Nikkei Singapore Aluminium Pte. Ltd.

PT. Nikkei Trading Indonesia

Centro Nippon Fruehauf Cooltech Inc.

North America and Europe

Toyal America, Inc.

Nippon Light Metal North America, Inc.

Nippon Light Metal Georgia, Inc.

Nikkei MC Aluminum America, Inc.

T.S.T. Nikkei Metales S.de R.L. de C.V.

Toyal Europe S.A.S.U.



Shandong Conglin Fruehauf Automobile Co., Ltd.



Nippon Light Metal Georgia, Inc.



Toyal America Inc.



Nikkei MC Aluminum America, Inc.



CMR Nikkei India Pvt. Ltd.



Toyal Europe S.A.S.U.

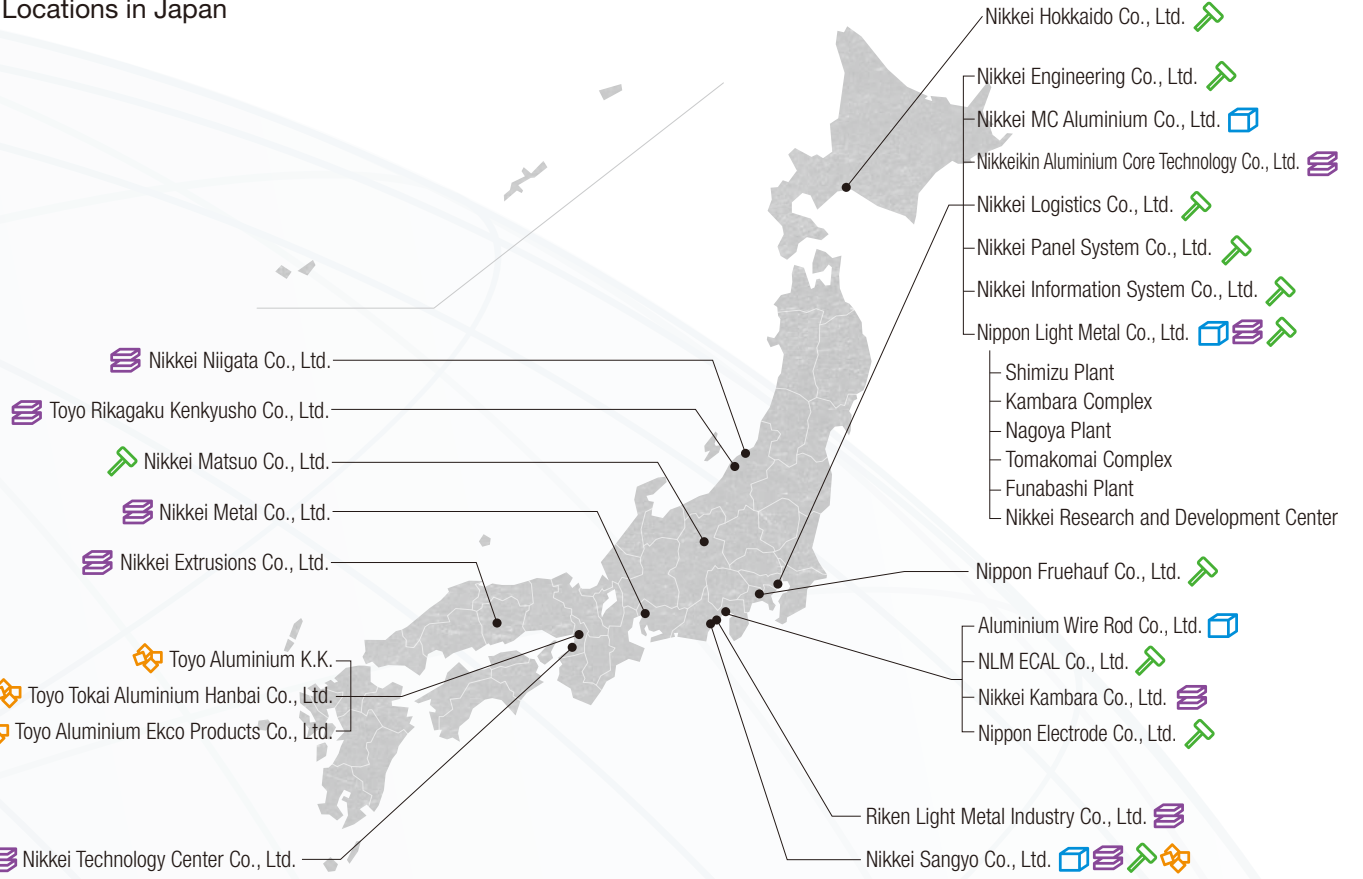


Nikkei Siam Aluminium Ltd.



Fruehauf Mahajak Co., Ltd.

Locations in Japan



Aluminum Ingot  
and Chemicals

Aluminum Sheet  
and Extrusions

Fabricated Products  
and Others

Aluminum Foil,  
Powder and Paste

Sales and  
Marketing Site

# The NLM Group's Global Reach

The NLM Group is broadening its worldwide presence to keep pace with the globalization of its customers.



Corporate History

1939▶▶First Founding

- 1939 · Nippon Light Metal Co., Ltd. incorporated jointly by Furukawa Electric Co., Ltd., and Tokyo Dento (currently TEPCO) to start aluminum smelting.
- 1940 · Aluminum smelting at Kambara Plant (currently Kambara Complex) started.
- 1941 · Aluminum production at Shimizu Plant started.
- 1945 · Nippon Electrode Co., Ltd. established.
- 1949 · Listed on the Tokyo Stock Exchange.

1952▶▶Second Founding & Progress

- 1952 · Capital and technology cooperation with Aluminium Limited (currently Rio Tinto Alcan Inc.) of Canada established.
- 1962 · Nikkei Building (former headquarters building) completed in Ginza, Tokyo.
- 1963 · Technical ties with Fruehauf International Limited of the U.S. started. Nippon Fruehauf Co., Ltd. established.

1974▶▶Fabrication Business Development

- 1974 · Merger with Nikkei Aluminium Co., Ltd.
- 1978 · Merger with Nikkei Aluminium Rolling Co., Ltd.
- 1984 · NLM Group construction material business integrated to establish Shin Nikkei Co., Ltd.
- 1985 · Nikkaru Extrusion Co., Ltd. merged into Nippon Light Metal Co., Ltd. (currently Nikkei Kambara Co., Ltd.).
- 1986 · Sales division of NLM Group's construction material department merged into Shin Nikkei Co., Ltd.
  - Nonfemet International Aluminium Co., Ltd. established in Shenzhen, China.
- 1989 · Nikkei Kako Co., Ltd. merged into Nippon Light Metal Co., Ltd.
- 1991 · Taishin Light Metal Co., Ltd. merged into Nippon Light Metal Co., Ltd.
- 1995 · Nikkei Techno-Research Co., Ltd. merged into Nippon Light Metal Co., Ltd. Nikkei Research and Development Center (NRDC) established.
- 1996 · NLM headquarters moved to Higashi-shinagawa, Shinagawa-ku, Tokyo.
  - Capital participation in Toyo Aluminium K.K. initiated.
- 1999 · Toyo Aluminium K.K. merged into Nippon Light Metal Co., Ltd.
- 2000 · Nikkei Shoji Co., Ltd. merged into Nikkei Sangyo Co., Ltd.
  - Shin Nikkei Co., Ltd. established as a 100% subsidiary.
- 2002 · Panel system division separated to establish Nikkei Panel System Co., Ltd.
  - Extrusion and light pressure fabricated products division (except Container section) separated to establish Nikkeikin Aluminium Core Technology Co., Ltd.
  - Toyo Aluminium division merged into Toyo Aluminium K.K.

2003▶▶Global Business Development

- 2003 · Alcan Nikkei Siam Ltd. (currently Nikkei Siam Aluminium Ltd.) established as consolidated subsidiary.
- 2004 · NI Nikkei Shenzhen Co., Ltd., a company for fabrication and sales of aluminum extrusion products for automobile parts, established jointly with Nonfemet International Aluminium Co., Ltd.
- 2005 · M.C. Nikkei Aluminium (Kunshan) Co., Ltd. (currently Nikkei MC Aluminium (Kunshan) Co., Ltd.) established.
- 2007 · Casting and die casting business merged with M.C. Aluminum Co., Ltd., a subsidiary of Mitsubishi Corp., to establish Nikkei MC Aluminium Co., Ltd., later becoming subsidiary.
  - Toyal Zhaoqing Co., Ltd. established in Zhaoqing, China by Toyo Aluminium K.K.
- 2008 · Nikkei (Shanghai) Body Parts Co., Ltd. established in Shanghai, China.
- 2010 · All shares of Shin Nikkei transferred to JS Group Corporation (currently LIXIL Group Corporation).
  - Nikkei (Shanghai) International Trading Co., Ltd. established in Shanghai, China.
- 2011 · Nikkeikin Kakoh Kaihatsu Holdings Co., Ltd., an intermediate stock holding company, established to control the group's extrusion and extrusion process business.
- 2012 · Nippon Light Metal Holdings Co., Ltd. established as a pure holding company for the Group.
  - Completion of raw materials shift from bauxite to aluminum hydroxide at Nippon Light Metal's Shimizu Plant.
- 2014 · Nippon Light Metal Co., Ltd. discontinues its electrolytic aluminum smelting business.
- 2015 · Toyo Rikagaku Kenkyusho becomes a subsidiary.
- 2018 · Nippon Light Metal Co., Ltd. makes Sumikei-Nikkei Engineering Co., Ltd. a consolidated subsidiary.
- 2019 · Headquarters relocated to Shimbashi, Minato-ku, Tokyo.
- 2020 · Sumikei-Nikkei Engineering Co., Ltd. changes its name to Nikkei Engineering Co., Ltd.

Corporate Profile

Trade name	Nippon Light Metal Holdings Company, Ltd.
Headquarters	Urbannet Uchisaiwaicho Building, 1-1-13 Shimbashi, Minato-ku, Tokyo 105-8681 Japan
Date of establishment	October 1, 2012
Capital	46,525,000,014 yen
Employees	12,750 (consolidated)

\*The data shown above is for fiscal 2021, or current as of the end of March 2022.

For more information about the NLM Group, please visit the website of Nippon Light Metal Holdings Co., Ltd. You can also use the following 2D codes to view specific pages.



Nippon Light Metal Holdings Co., Ltd.  
Website



Nippon Light Metal Holdings Co., Ltd.  
List of Directors and Organization Chart



NLM Group  
List of Group companies



NLM Group  
Sustainability



NLM Group  
History



Nippon Light Metal Holdings Co., Ltd.  
To Our Shareholders/Investors



Nippon Light Metal Holdings Co., Ltd.  
News Releases