Before using any of the products introduced in this catalog, please read the respective user manuals thoroughly.

The contents of this catalog are subject to change without prior notice.

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Catalog No.: HE-24-AI (26)
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Printed in April 2019
Our unique, high-performance materials - the fruit of the development and technical capabilities that Hitachi Metals has built up over time - hold consistently vast potential.

Our products are uniquely suited to fulfilling roles in areas that hold global promise, such as the creation of safer, more energy-efficient vehicles; the transition to next-generation aircraft, energy and railroad technologies; and the further progress of medical treatment.

There are issues that only our products can solve.

We will continue to grow and evolve alongside society at large by identifying new customer needs and providing the optimal solutions for addressing them.

At Hitachi Metals, our aim is to become the world’s leading high-performance materials company.
Producing high-performance materials for global infrastructures across borders and industries.
Accelerating the evolution of automobiles with our development and technological capabilities.

Proliferating eco cars and improving fuel economy and safety performance — We appropriately capture changes in environmental performance required for automobiles, thus relentlessly pursuing the evolution of all of our products.

Ranging from drive motor components and exhaust system components to chassis components — We use our development and technological capabilities to support automobile manufacturing around the world.

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Eco Car-related Components
Supporting the evolution of eco cars with magnetic and metal materials that withstand harsh environments around engines.

Neodymium magnet
NEOMAX® series
We are leading the way globally in manufacturing Nd-Fe-B sintered magnets, which have optimum magnetic properties for use in the drive motors of electric and hybrid vehicles. The NEOMAX®, which we developed and mass produce, can be used in a broad spectrum of applications and in environments that range from room temperature to the mercilessly high temperatures around engines. In addition, we upgraded our environmental friendly Dy-free magnets to meet diversifying, weight reduction, and high efficiency needs.

Heavy Rare Earth Diffusion Technology
The innovative technology enabled development of magnets with further less content of heavy rare-earth elements, including dysprosium, than the existing Dy-deposition and diffusion technology, while achieving higher heat resistance or magnetism. It gives a significant impetus to downsizing and upgrading motors for driving electric and hybrid electric vehicles.

Enamelled Wire
for High-Efficiency Motors
This wire product supports the compact design and higher outputs required for electric and hybrid vehicles while reducing environmental impact and saving energy, leading to the development of higher-performance electric and hybrid vehicles.

High-Performance
Pure Copper HiFC™
Pure copper includes impurities such as oxygen and sulfur. The function of these impurities is under control by trace amounts of titanium added to molten copper (dissolved electrolytic copper). In this way, copper appears to be highly purified, increasing its softness, weldability, resistance to embrittlement due to hydrogen, and electrical conductivity.

Clad Materials for Lithium Ion Batteries
Our clad materials are used for terminals and leads of lithium ion batteries for electric vehicles. The clad materials have low electric resistance and are weldable, contributing to the longer life, downsizing, and productivity increases of batteries.

Aluminum Cases Containing EV/HEV Components
(Battery, Motor and Inverter)
The aluminum cast cases are manufactured through a series of die casting including gravity, low pressure and high pressure die casting processes. They help reduce the weights of the overall vehicles because of their material composition and higher freedom in shaping. The cases may accommodate any water-cooling circuits, which helps maximize vehicles’ cooling capability.

HERCUNITE™*
Series of Heat-Resistant Cast Components
This series of heat-resistant cast-steel/cast-iron product helps reduce CO₂ emissions and fuel consumption in gas engine vehicles etc. The products are applied in turbine housings, exhaust manifolds and other exhaust system. They are able to withstand the extreme heat generated by an internal combustion engine and contribute to improving a car’s environmental performance.

*The origin of the name HERCUNITE™
The name HERCUNITE is an acronym for heat-resisting cast materials for unit of exhaust parts; however, the name has another derivation. The suffix nite, which stands for a metal compound, is preceded by the name Hercules, a hero in Greek mythology.

Drive Motor for EV
Battery Case
Inverter Case
Battery Case
Aluminum Cases Containing EV/HEV Components
(Battery, Motor and Inverter)
Engine and Exhaust System-related Components

Using our alloy design techniques cultivated in the specialty steel field and our casting techniques refined in the long history of the company to produce heat-resistant components that meet needs.

**Piston Ring Materials**

With the call for more compact yet more powerful engines, steel piston rings have come to be widely employed. Controlling metal texture has made it possible for Hitachi Metals to provide piston ring materials with increased abrasion resistance and improved sliding friction in the form of precision shaped wires that have undergone plastic working and heat treatment.

**HERCUNITE™ Heat-resistant Cast Components**

The HERCUNITE™ is a heat-resistant cast steel and iron material that is suited for exhaust system components, including turbine housings and exhaust manifolds. The main product in the lineup is the HERCUNITE™ S-series with the maximum operating temperature of approximately 1,050°C. This material is becoming widely used due to the increased use of turbochargers to downsize engines as a means of improving environmental performance.

**Engine Valve Materials**

Our engine valve materials are highly heat-resistant, strong, and cost-effective, thus contributing to the weight reduction and durability increase of engine valves.

**Others**

Other products we provide include materials for fuel injection systems, spark plugs, sintered strip, semiconductor producing equipment material, bearing materials, etc.

**Turbine Wheels for Turbochargers**

Turbine wheels for turbochargers are made of nickel-based heat-resistant super alloy that exhibit superior resistance to heat. The investment casting is employed to produce three-dimensional components with complicated monobloc casting.

**Diesel Particulate Filters**

Hitachi Metals’ Diesel Particulate Filters are honey comb structured cordierite ceramics filter developed for an after treatment device of medium and heavy duty trucks and buses which can remove PM efficiently from exhaust gas from diesel engines.

**Ni-based Amorphous Brazing Foil**

Ni-based amorphous brazing foil has low environmental impact because it does not contain organic binders. Furthermore, since this metal is thin and shows high corrosion resistance, it is suitable for brazing of several kinds of heat exchangers.

**Lithium Ion Battery-related Components**

Contributing to the weight reduction, downsizing, and capacity increase of batteries.

**Clad Foils for Lithium Ion Battery’s Power Collector**

Our rolled clad foils, which are made of Ni alloy and Cu, contribute to achieving electric characteristics required for power-collecting foils and increasing the strength of power-collector.

**Clad Coils and Terminal Components for Bonding Battery Electrodes**

Our clad coils and terminal components enable the connection of different materials between positive and negative electrodes (e.g. aluminum and copper), and facilitate the effective interconnection of batteries (resistance welding, ultrasonic welding, and laser welding).
Steering System and Powertrain-related Components

Developing high-quality metal materials and various magnetic materials that are essential for CVTs (continuously variable transmission), electric power steering systems, and transmissions.

Neodymium Magnets NEOMAX® Series
– Radially Anisotropic Ring Magnets

Neodymium magnets are often used for electric power steering systems to meet the needs of downsizing and high efficiency. Hitachi Metals offers not only commonly-used block and arc-shaped magnets but also radially anisotropic ring magnets. The magnets have a higher freedom in setting the number of poles, and they may be magnetized at a skewed angle relative to the rotation axis to reduce cogging torque (rotation unevenness). Our ring magnets can help increase the efficiency of devices for motorization (e.g. EGR).

CVT Belt Materials

These metal belt materials have excellent fatigue endurance and were developed for use in CVT systems. Preventing nonmetallic inclusions that can cause damage when melting and cold rolling techniques are used, we contribute to upgraded transmission performance and increased reliability.

Waupaca Foundry, Inc. is the world’s largest foundry of iron castings, providing a wide variety of products for use in items ranging from passenger cars, commercial vehicles to construction and off-highway vehicles. Waupaca Foundry’s iron castings are superior in dimensional accuracy, and can be delivered to customers in a near-net-shape state, thus contributing to the production of weight reduction, thinner-walled components.

Chassis-related Components

Continuing to pursue best suited materials, shapes, and manufacturing techniques, thereby reducing weight, increasing fuel economy, and improving safety.

High-toughness Ductile Cast Iron Products HNM™ and NMS™

Our ductile cast iron products have high toughness at low-temperature and high dimensional accuracy. Our products, which cover a variety of materials and sizes, to meet the various applications from small passenger cars to large commercial vehicles as global supplier. We supply products with near net shape manufacturing and contribute to the weight reduction of automobiles.

Brake Hoses

With outstanding durability and low expansion characteristics, our brake hoses have been widely acclaimed and are used by the world’s leading automakers.

Harness for Electric Parking Brakes

We developed harnesses for use in electric parking brakes that excel in flexural resistance and durability. Their high integrability with the ABS sensor harness allows effective space conservation inside the cabin and increases vehicle safety and convenience.
Manufacturing Facilities

Developing materials for manufacturing facilities, including flexibly processable and highly durable steel for tools, according to needs, thereby contributing to the improvement of production efficiency.

**SLD-MAGIC™ Cold Work Tool Steel**

This die steel is suited to high-tensile plates widely used in making lighter cars with safer designs. Its characteristics are high machinability and fewer dimensional deformities following heat treatment. It contributes to overall die cost reductions because its superior quality means that dies last longer.

**YASUGI SPECIALTY STEEL**

**OUR HERITAGE, YOUR ADVANTAGE**

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**DAC-MAGIC™ Die Cast Tool Steel**

This die cast tool steel is used in manufacturing highly precise castings in large volumes quickly. It combines the ability to withstand high temperatures during heating and quenching in the heat treatment cycle with toughness, and minimal cracking in cooling channels contributes to improvements that mean longer-lasting dies.

**Steel for Plastic Tools**

**HI-PM™ and CENA™ Series**

We offer a wide variety of materials for tools so that customers can choose best suited materials to meet various manufacturing property requirements for plastic products.

**Sialon Ceramics Die Cast Sleeve**

Sialon die cast sleeve consists of two layers, the inner Sialon engineering ceramics layer and the outer specialized alloy layer. This product excels at maintaining the temperature of molten metal and achieving stable injection and a longer service life, thus contributing to the improvement of productivity and quality of die casting.

**Electric Discharge Machining [EDM] Wires**

Our EDM wires, which are made of carefully selected materials, enable high-speed and high-precision cutting. We offer a wide variety of electrode wires for different applications to meet various needs.
Electric and Electronic Components

Offering products with distinctive features, including energy saving, noise reduction, and high heat release, thereby promoting the addition of electronics to automobiles.

Neodymium Magnets
NEOMAX® Series

The NEOMAX® is a rare-earth magnet with the world’s leading magnetic property. The NEOMAX® magnets are used in various electric motors for automobiles, and represent the key components for vehicle downsizing, weight reduction, efficiency improvement and energy saving. Now, their environmentally friendly and upgraded versions, Dy-free magnets are available. They will continue to prove to be useful in applications of electronically controlled components, including shift gears and electric brakes.

Ferrite Magnet NMF™ Series

Ferrite magnets, which consist primarily of iron oxide, are cost effective and the most widely used in motors for automobile electric and electronic components. Among the NMF™ series, the series 15 has the world’s leading property as a mass-produced ferrite magnet. The excellent magnetic property and the resistance to temperature changes are suitable for a wide range of applications ranging from starter motors, power window motors, cooling fan motors, and electric power steering motors, to windshield wiper motors.

Si3N4 Insulating Substrates for Power Semiconductor Modules

Our insulating substrates are used in power semiconductor modules for inverters in hybrid and electric vehicles. Because of their superb heat conduction and mechanical strength, Hitachi Metals’ silicon nitride substrates are best suited as insulated substrates for large power semiconductors that require high reliability, including insulated gate bipolar transistors (IGBT) and silicon carbide (SiC) devices. They also have an excellent thermal conductivity of 130 W/m·K.

Harnesses for use in Hybrid Vehicles

Harnesses connect the battery, inverter and motor in hybrid vehicles. Our products have superior heat resistance, oil resistance and flexibility. They are extremely reliable in high-voltage and large-current areas. We also supply air-conditioner harnesses and other products in support of the move to electric-powered onboard equipment.

Ultrahigh Density Bonded Magnet
HIDENSE™ Series

The HIDENSE™ is a high-performance bonded magnet developed with the high-compression technology. This magnet is highly flexible in shape and magnetization and can be integrated with metal components, thus contributing to a wide range of product designs.

Cast Magnets (CKSC™) / Rolled Magnets (CKSR™) Series

The CKSC™ and CKSR™ series are cast magnets with the characteristics of alnico magnets, a high residual flux density, and a low cobalt content. Because the temperature coefficient for the residual flux density is small (±0.02%/K) and the Curie temperature is high, these magnets are often used for sensors located near engines that require high heat resistance.

Metal Powder Core HRM Series

The products are cores for power inductors used in various information equipment and automotive electrical equipment. They have about 3 times higher saturation magnetic flux density and almost twice higher radial crushing strength than Ni-Zn ferrite products, which were conventionally used. They contribute to miniaturize inductors and use of large current operation (improvement of DC bias current characteristics).

Electromagnetic Compatibility (EMC) Noise Reduction Products

These noise reduction products can prevent the malfunction of electronic devices. Hitachi Metals’ nanocrystalline soft magnetic alloy FINEMET® and amorphous alloy contribute to downsizing and weight reduction of noise filters.
We offer more reliable and innovative social infrastructure.

Industrial Infrastructure-related Field

Aircraft components, power generating equipment-related components, rolling stock components and other industrial equipment are all exposed to severe operating conditions. Our technologies, quality and product development capabilities, which were developed and proved over many years, have always been bringing innovation. We will continue to provide high-level reliability and innovation for infrastructure globally.

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Materials for Aerospace Engines and Structural Parts

Materials for aerospace engines and structural parts, such as landing gears, must be durable to withstand high-temperature, high-pressure combustion gases, high-speed revolutions, and repetitive heavy loads for an extended period of time. Therefore, such component materials must be highly reliable and durable. Our materials for aerospace components are highly acclaimed and trusted thanks to our special melting technologies and manufacturing processes that have been nurtured over the years.

Rolling stock-related components

Our wires, cables and casting products have been long used for bullet and other different trains nationally and internationally and have brought contributions to railway development locally and globally.

Wires and Cables for Rolling Stock / Contact Wires with Wear Detection Line for Bullet Trains

For bullet trains and many other trains, operated both in Japan and overseas, our wires and cables are used in cabo, underfloor wiring, and wiring between rolling stock. We also provide railway vehicle cables and contact wires as well as signal cables, thus supporting power supply and information transmission for railways.

Ductile Cast iron products for bogie of rolling stock

The products have high low-temperature toughness and dimensional precision. The near-net shape and the integrated casting with high shaped flexibility. The weldingless structures help to improve the reliability and reduce the weight.

Materials for Aircraft components

Our special melting technologies and manufacturing processes, which were developed over many years, deliver materials for aircraft featuring world-class reliability and durability.
Power generating equipment-related components

Our high-quality products meet requirements of diversified power generation technologies: thermal, wind and photovoltaic.

Turbine Blade Materials

Turbine blades rotate at very high speeds and are vital components that need to be durable to withstand extreme conditions such as exposure to high temperature steam. As such, they must be strong at high temperatures, have a high degree of fracture toughness, and be reliable in terms of quality. We provide reliable products by utilizing our integrated manufacturing system, which draws upon our broad expertise and the latest technologies, helping our customers generate power more efficiently.

Amorphous Alloys

Metglas®

The material is used to manufacture core components for distribution transformers such as pole transformers. It is also used as cut cores in the power conditioner reactor for renewable energy including solar and wind power. By replacing an electrical steel core with an amorphous alloy core, no-load loss (standby energy) generated in a core can be reduced and higher efficiency and energy saving can be achieved. The demand for amorphous alloys is increasing in national and international markets as one of the effective materials to contribute to CO₂ emission reduction for countermeasures against climate change.

Neodymium Magnet

NEOMAX® Series

The rare-earth magnet product has world-class magnetic properties. It has been a critical material for smaller and more efficient wind power generation systems.

ZMG™ 232 Series for Solid Oxide Fuel Cell (SOFC) Interconnects

This material, made of a ferrite alloy consisting primarily of iron and chrome, is used in separators that link cells in SOFCs electrically. It has oxidation resistance over long periods, has good conductivity in high-temperature environments, and achieves nearly the same thermal expansion coefficient as that of electrode materials.
Industrial equipment

Our unrivaled development and technological capabilities continue to drive innovation in manufacturing and R&D fronts.

Rolls for Steel Mills

Our rolls for steel rolling mills have higher strength and wear-resistance and enable more efficient production of high-precision rolled products. A variety of products are available to manufacture steel plates, pipes, bars, and wires as well as other shaped steels in response to many different demands from steel product manufacturers. Most notably, our HINEX™ products, which was the first commercially available high-speed steel-based composite rolls in the world, and other high-speed steel composite rolls, have significantly better rolling performance than traditional rolls, and help improve rolling productivity and quality.

Linear Motors / Linear Stages

Linear stages equipped with our proprietary linear motors can meet different needs, including high-accuracy positioning, and high-speed operations, and long strokes.

Cylinders and Screws for Injection Molding Machines

The H-ALOY™ cylinders lined with nickel- or cobalt-based alloy. YPT™ screws contain nickel and cobalt. Both products have high performance, excellent wear- and corrosion-resistance.

Undulators

We supply undulators to SPring-8, a large synchrotron radiation facility capable of producing the most powerful synchrotron radiation in the world, and SACLA, an adjacent X-ray Free Electron Laser (XFEL) facility. To generate synchrotron radiation, magnets are used to change the path of electrons that have been accelerated to nearly the speed of light. Extremely bright and highly directional synchrotron radiation contributes to wide-ranging research in everything from nanotechnology and biotechnology to industrial applications.

Flexible Cables

Cables with superior flexibility are used to supply power and signals to cranes and hoists inside plants (supplemental equipment for cranes). Since they are also durable enough to be used in harsh environments, these cables are expected to play a role in mining and other areas of the resource extraction sector.

Industrial Robot Cable

The highly flex-resistant and flexible cables are ideal for moving portions of industrial robots, where resistance to repeated bending and twisting and durability are critical requirements. In addition, a wide range of wire and cable products are available to meet many different needs for power supply, control, and signal transmission cables and wires connecting components within and between equipment.

Industrial Robot Cable

Our cable portfolio includes an extensive range of optimal products for electricity transmission / distribution system, construction and other industrial business. Our technologies and long experiences allow us to offer best proposals to customers.

MLFC™ Flame-Retardant Polyflex Insulated Wire

MLFC™ flame-retardant polyflex insulated wire has been widely used for electric wiring, including insulated wire inside switchboards and motor lead wires, because of its outstanding heat resistance, flame-retardant properties, and flexibility.

High Performance Pure Copper HiFC™

The material contains trace amounts of titanium, which are added into molten electrolytic copper in its manufacturing process. Titanium inhibits effect of oxygen and sulfur in the product and allows it to act as if it were “highly purified.” The pure copper provides improved softness, weldability, hydrogen-embrittlement profile, and electric conductivity.
The products are used as exposed-type fixed column bases to construct steel frame buildings. The highly workable column bases provide superior earthquake resistance, significantly shorter work periods and reduced installation space.

The product is used in diaphragm-through beam-column joint that connects upper and lower story columns of different width.

Antistatic Rubber Sheets COSTAC

Our COSTAC lineup of antistatic rubber sheets enjoy extensive use as static electricity countermeasures at plants engaged in the manufacture of semiconductors and electronic devices as well as other locations. Products free from the substances restricted under the RoHS 2 directive are also available.

Handrails

Handrails are rubber and urethane resin products used for escalators and moving walkways. Boasting safety enhancements that improve the grip and make the handrails more eye-catching, this product line also comes in eight standard colors.

SOFLEX™ Corrugated Stainless Steel Tubes and Fittings (Push impact™)

SOFLEX™ is the name of our line of flexible stainless steel gas tubes and fittings. They are easy to install and maintain because the tubes require few connections along the way. It also provides highly trusted connection from its unique design.
Telecommunication infrastructure components

We will offer various products and solutions to mobile station bases and data centers.

**SAM™ and Aera™ Mass Flow Controllers**

Mass flow controllers are devices that precisely control the volume of gas flowing within a gas supply system used for deposition and etching in a semiconductor manufacturing line. Our products are featured with a waveform diaphragm made of our proprietary Ni-Co alloy installed within the valve. They have clean structures in which the parts that come in contact with gases are equipped with metal seals, and we have a complete lineup suited to a range of purposes. We continue to release digital mass flow controllers that address the requirements of the ever-evolving semiconductor process in order to contribute to further advance of semiconductor manufacturing technologies.

**Closed Type Diaphragm Expansion Tank**

Our closed type diaphragm expansion tank loses less thermal energy. Our closing systems eliminate potential intrusion of dust or foreign materials from outside of system and maintain high level of cleanliness. Less oxygen is supplied to the systems, which reduce chance of corrosion within piping.

**Razor Blades Materials**

YSSTM High-class cutlery steels include Shirogami™ and Kigami™ carbon steel products, Aogami™ alloy steel products and Gingami™ and ATSSTM 34 steel products. The materials are widely used to make a variety of kitchen knives, scissors, razors and custom knives.

**LTCC (Low Temperature Co-fired Ceramics) Substrate**

High-integrated LTCC circuit substrates are available, which build on the unique technologies acquired through the efforts to develop RF front-end module. We offer a full package of services ranging from material development through circuit and millimeter-wave antenna designs. Our state-of-the-art technologies, including mirror polishing that reduces micro wiring thickness down to 1 to 2 μm, will help IoT innovations.

**Wireless base station isolators / circulators**

These components function so that the amplifier that regulates the audio during communication operates stably and prevents intermodulation. Using high-performance ferrite magnets and low-loss garnets, these isolators and circulators enable size and weight reductions and are compatible with next-generation (5G) network specifications.

**Primestar™ VCI**

Hitachi Metals’ optical fiber products are critical components of the patented low-loss optic connection technology. The technologies support highly reliable optical fiber monitoring system, Primestar VCI, required for important data communication services in financial and broadcasting businesses. They also simplify monitoring and maintenance processes, and contributes to improving efficiency and labor saving of wiring and maintenance activities, which are indispensable in the data center.

**Wireless base station isolators / circulators**

These components function so that the amplifier that regulates the audio during communication operates stably and prevents intermodulation. Using high-performance ferrite magnets and low-loss garnets, these isolators and circulators enable size and weight reductions and are compatible with next-generation (5G) network specifications.
We meet increasingly diverse and sophisticated needs in a prompt and accurate fashion.

The fields of video / IT equipment, home appliances, batteries and medical devices are constantly evolving. Our production system, encompassing the entire process from prototype to commercialization and mass production, allows us to meet our customers’ diverse needs. We will continue to support the growth of society at large with high-performance components and materials.

**Electronics-related Field**

The fields of video / IT equipment, home appliances, batteries and medical devices are constantly evolving. Our production system, encompassing the entire process from prototype to commercialization and mass production, allows us to meet our customers’ diverse needs. We will continue to support the growth of society at large with high-performance components and materials.

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Medical device-related components

With our ultra-fine cable, tube and ceramic products, we will help improve the performance of medical devices and contribute to the progress of medical treatment.

Probe Cables for Ultrasound Diagnostic Equipment

The cable connects the main body of ultrasound diagnostic equipment and the probe used for echographic investigation. It is lightweight, excels in elasticity and flexibility, and has high-quality electric characteristics, realizing ease of handling and high-definition images, thereby contributing to the development of medical equipment.

Tubing for Medical Application

In addition of manufacturing capability of precision extrusion tooling, the experience and extrusion technology for tubing would provide high-end tubing* for medical application such as vascular access.

* Including multi-lumen, multi-layer assemblies

Ceramic Scintillator Materials

Scintillator materials absorb the energy of radiation that strikes them and emit it as visible light. Because of their high sensitivity and large X-ray absorption coefficients, they contribute to reductions in device sizes. They are used in X-ray CT scanners and other medical equipment as well as analytical devices.
Electronics-related Field

Electronic device-related components

Magnetic materials that are the first of their kind and metallic materials with unique features allow us to make electronic devices smaller and more energy-efficient.

Amorphous Alloys
Metglas®
These alloys are used for cores of inductive components such as transformers and reactors because of low core loss.

Fe-based Amorphous Alloys
These are Fe-based alloys. Due to the low no-load loss of amorphous alloys compared to that of electrical steel, amorphous alloys contribute to the energy saving of components for power electronics devices.

Ni-based Amorphous Brazing Foil
The foil-type amorphous brazing filler metal, which consists primarily of nickel, has low environmental impact because it does not include organic binders. Furthermore, this material is thin and highly resistant to corrosion, which is best suited for brazing heat exchangers.

FINEMET® Nanocrystalline Magnetic Alloys
FINEMET® is the world’s first nanocrystalline soft magnetic alloy developed by Hitachi Metals. This new Fe-based soft magnetic alloy is composed of nanocrystals. It has high saturation induction, high permeability, excellent temperature characteristics and temporal stability. FINEMET® is utilized in high-frequency power transformers, noise-suppression components and other applications where it contributes to downsizing and lightening.

Common Mode Choke Cores and Coils
Installed with high magnetic permeability and low Q factors, these cores and coils furnish high impedance over a broad frequency range, allowing them to manifest major noise suppression effects. Moreover, because impedance does not vary widely by temperature, stable noise suppression effects can be obtained over a broad temperature range.

Cut Cores
Used in medium-frequency power transformers and choke coils, cut cores contribute to higher efficiency and smaller sizes. FINEMET® nanocrystalline magnetic materials and amorphous metal products suited to various uses are available.

Amorphous Powder Cores / Coils
These are amorphous powder cores and coils. The amorphous powder can be used for smoothing choke coils for both input and output of power supply and choke coils for power factor correction circuits and EMI filters. The coils are able to operate at high frequency and contribute to reducing size and improving efficiency.

Soft Ferrite Core
These soft magnetic cores are mainly composed of iron oxide. Although they have a slightly low saturation flux density (about 0.5 T), their electrical resistance is high, and they are characterized by excellent magnetic properties in high-frequency bands from 100 kHz to several tens of MHz. They are used as cores for the inductive components installed in mobile communications equipment and electric components of automobile in order to make electronic devices more efficient and in order to reduce electromagnetic noise.

Ni-based Amorphous Brazing Foil
The foil-type amorphous brazing filler metal, which consists primarily of nickel, has low environmental impact because it does not include organic binders. Furthermore, this material is thin and highly resistant to corrosion, which is best suited for brazing heat exchangers.

Amorphous Powder Cores / Coils
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Highly Thermal Conductive AITiC Substrates for Thin Film Magnetic Heads
These substrates are used in thin-film magnetic heads for large memory capacity hard drives. They have made it possible to provide the properties required for highly precise data scanning, contributing to larger capacity drives that are more reliable.

FM SHIELD™
Magnetic Shield Sheet
The product consists of laminated FINEMET® nanocrystalline soft magnetic material ribbon and polyethylene terephthalate film. The shield sheet protects electronic devices from electromagnetic noise and provides robust shield in shield boxes or rooms within buildings exposed to environmental magnetic fields like electric power distribution facilities.
Among growing interest in rare-earth elements, we have begun the mass production of our 15 Series of high-performance ferrite magnets, which boast the world’s best magnetic properties among mass-produced ferrite magnets. Ferrite magnets, which offer good cost performance, are used in motors for the compressors of air conditioners and refrigerators, as well as in dishwashers / dryers and other appliances.

**Sputtering Target Materials for LCDs**

The Sputtering Target materials are used for thin film interconnects of LCDs. Our HIP (Hot Isostatic Press) method enables to obtain fine and homogeneous structure, which corresponds to the requirement of increasing in size. Furthermore, our alloy design technology enables to provide various alloy materials as usage, which responds to the requirement like low-value resistance, high heat resistance, and high moisture-resistance.

**Ferrite Magnets NMF™ Series / Anisotropic Ferrite Magnets**

Amidst growing interest in rare-earth elements, we have begun the mass production of our 15 Series of high-performance ferrite magnets, which boast the world’s best magnetic properties among mass-produced ferrite magnets. Ferrite magnets, which offer good cost performance, are used in motors for the compressors of air conditioners and refrigerators, as well as in dishwashers / dryers and other appliances.

**Lead Frame Materials**

We provide an extensive lineup of iron nickel-based and copper-based lead frame materials; materials for logic families and power semiconductors, and dual gauge copper strips which has a multi thickness design in width direction.

**FINEMET® Multilayered Sheets**

These shield yoke sheets are used in wireless chargers for smartphones, tablet PCs, and other communications devices. The lamination processing of FINEMET®, a high magnetic permeability material with low core loss, enables a slimmer size and lighter weight and achieves impressive cuts in power transmission noise and energy loss.

**Magnet roll**

We offer the optimal magnet rolls for a variety of magnetic development from low- to high-speed color printing. Available sizes range from small-diameter (A4 size) to large-diameter rolls (A0 size).

**Ferrite Magnets NEOMAX® Series**

These rare-earth magnets have world-leading magnetic properties. They are used as motor components in the automobile, IT, household appliance, medical equipment, environmental, energy and other industrial sectors. In addition, upgraded environmental friendly Dy-free magnets are now available. The series are key components for smaller, lighter, more energy-efficient equipment.

**Photocopying machine-related components**

**Toner sensors**

Thanks to planar coils and unique detection systems, our toner sensors are both ultra-thin and high-precision. This contributes to further reducing the size of photocopying machines and improving image quality.

**Metal Powder Injection Moldings (MIM process)**

The metal injection moldings (MIM) process is a technique to manufacture metal components by injecting metal powders in specific molds. It characteristically offers a high degree of freedom in designing materials and components.

**Rubber Rollers**

Rubber rollers are used in the development and transfer process of images as well as toner fixing processes in copy machines and printers. They facilitate office equipment performance such as in stable paper feed and high-speed, high image quality printing.

**Precision molding technologies**

**Neodymium Magnets NEOMAX® Series**

We provide an extensive lineup of iron nickel-based and copper-based lead frame materials; materials for logic families and power semiconductors, and dual gauge copper strips which has a multi thickness design in width direction.

**Lead Frame Materials**

We provide an extensive lineup of iron nickel-based and copper-based lead frame materials; materials for logic families and power semiconductors, and dual gauge copper strips which has a multi thickness design in width direction.

**FINEMET® Multilayered Sheets**

These shield yoke sheets are used in wireless chargers for smartphones, tablet PCs, and other communications devices. The lamination processing of FINEMET®, a high magnetic permeability material with low core loss, enables a slimmer size and lighter weight and achieves impressive cuts in power transmission noise and energy loss.

**Magnet roll**

We offer the optimal magnet rolls for a variety of magnetic development from low- to high-speed color printing. Available sizes range from small-diameter (A4 size) to large-diameter rolls (A0 size).

**Ferrite Magnets NMF™ Series / Anisotropic Ferrite Magnets**

Amidst growing interest in rare-earth elements, we have begun the mass production of our 15 Series of high-performance ferrite magnets, which boast the world’s best magnetic properties among mass-produced ferrite magnets. Ferrite magnets, which offer good cost performance, are used in motors for the compressors of air conditioners and refrigerators, as well as in dishwashers / dryers and other appliances.

**Photocopying machine-related components**

**Toner sensors**

Thanks to planar coils and unique detection systems, our toner sensors are both ultra-thin and high-precision. This contributes to further reducing the size of photocopying machines and improving image quality.

**Metal Powder Injection Moldings (MIM process)**

The metal injection moldings (MIM) process is a technique to manufacture metal components by injecting metal powders in specific molds. It characteristically offers a high degree of freedom in designing materials and components.
The Hitachi Metals Group has developed a diversified business structure founded upon the development of high-performance materials. Our two business divisions will continue to meet the market’s diverse needs while functioning in both an autonomous and intertwined fashion. Going beyond individual market segments and national borders, at Hitachi Metals, our aim is to become the world’s leading high-performance materials company.

### Business Divisions / CSR of the Hitachi Metals Group

### Business divisions of Hitachi Metals

#### Bringing World-Class High-Performance Materials to Three Market Segments Through Two Business Divisions.

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#### Advanced Metals Division

- **Tool Steel & Roll**
  - Mobile and tool steel, Rolls for steel mills, Injection molding machine parts, Structural ceramic products, and Steel frame parts for construction
- **Industrial, Aerospace & Energy Materials**
  - Automobile-related materials, Razor and blade materials, Precision tool components, and Aircraft and energy-related materials
- **Electronic Material**
  - Display-related materials, Semiconductor and other package materials, and Battery-related materials
- **Automotive Casting**
  - HNMP™ high-grade ductile cast iron products, Tool iron products for transportation equipment, HERCO® high-strength exhaust housing components, and Aluminum components
- **Piping Components**
  - Piping and infrastructure components ("G"-Gourd brand pipe fittings, valves, stainless steel and plastic piping, Precision flow control valves, and precision expansion tanks)

#### Advanced Components and Materials Division

- **Magnetic Materials**
  - NICOSE® rare earth magnets, Ferrite magnets, and Other magnets and applied products
- **Power Electronics Materials**
  - Soft magnetic materials ("Hi-B" amorphous steel, FINemet™ amorphous magnetic material, and soft ferrite) and applied products, and Ceramic components
- **Electric Wire & Cable**
  - Industrial cables, Electronic wires, Electric equipment materials, Cable assemblies, and Industrial rubber products
- **Automotive Components**
  - Electronic components for automotive, and Brake hoses
Advanced Metals Division

Our steel manufacture and casting technologies draw upon over a century of tradition. It is into this tradition that we weave innovative concepts.

We add innovative concepts to existing foundational technologies stemming from the tradition - namely, steel manufacture technologies such as YASUGI SPECIALTY STEEL, and the casting technologies, which have yielded our proprietary Gourd brand™ pipe fitting products - to develop cutting-edge metal materials. Our products are extensively used in different industrial sectors. Beyond core industrial sectors including automobile and industrial infrastructure, they have penetrated into the fast-growing industries such as those of aircraft and energy sectors.

With world-class capabilities for the development of materials and products, as well as production scale and sales system that leverage our global network, we are able to promptly and accurately provide products to match needs arising in the markets of different countries worldwide.

Tool Steel & Roll
A long history of excellent metallurgical and casting technologies

True to our tradition, we strive to consistently enhance our material development capabilities. With the same closest attention as was historically required to manufacture tama-hagane, high-value-added material in Tatara iron-making, we select raw materials and manufacture clean steel products. Our proven casting technology will continue to drive our efforts to develop a wide range of industries and supply highly functional metal materials.

Industrial, Aerospace & Energy Materials
We focus on the highest reliability and safety

We always seek to become the most trustworthy and reliable partner for customers and to achieve the highest excellence in manufacturing skills. We manufacture automobile piston rings, CVT belt materials and aircraft engine components, which are all key components in their industries.

Electronic Material
Our technology opens up the future life

Our metal materials and processed products are extensively built into home appliances, electronics, automobiles, batteries, semiconductors, medical devices and many other products necessary in our daily lives. They may be invisible and not attract your attention, but they drive social progress and more comfortable life.

Automotive Casting
Global development of eco-friendly products

Drawing on its roots that date back to Tobata Foundry Co., Hitachi Metals has applied malleable cast iron manufacturing technologies to produce casting components for automobiles. In recent years, we have developed HERCUNITE™ heat-resistant exhaust casting components and been striving to meet the growing need for products helpful in reducing environmental load.

Piping Components
Development of (Gourd brand) gas and water piping components

When the Tobata Foundry Co., the forerunner of Hitachi Metals, Ltd., shipped its first product in 1910, its bore a (Gourd) symbol. This symbol bore the hopes and aspirations that products would be "tougher, smoother, and aesthetically pleasing." Since this time, the Gourd brand has been widely used in industrial and household fields, as well as overseas markets. Today, the (Gourd brand) is well respected throughout the world.

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Advanced Components and Materials Division

We deepen new material development and our unique innovative part design technology capabilities to bring unique products into existence.

We have developed NEOMAX®, world-class neodymium magnet, Metglas®, amorphous metal material with excellent soft magnetic properties, and HiFC™ high-performance pure copper with softening characteristics comparable to high purity copper. The functional members with specific characteristics have been integrated into xEVs* to support their progress. In addition, our products with different capability of improving environmental performance and energy efficiency support industrial infrastructure sectors, including railway, medical devices, and industrial robots.

We combine our proprietary materials and technologies to develop advanced products.

*Term referring to electric vehicles (EV), hybrid electric vehicles (HEV), and plug-in hybrid electric vehicles (PHEV).

Magnetic Materials

NEOMAX® brand, key material for industries

We boast an extensive magnet range, which includes NEOMAX® rare earth magnets and ferrite magnets, and provide our products across a wide range of fields, encompassing automobiles, electronics and home appliances. As pioneers in the field of magnetic materials, we take on the challenge of new materials and new production technologies, meeting our customers’ diverse needs and contributing to the creation of a more energy-efficient society.

Power Electronics Materials

Our Advanced Soft Magnetic and Ceramic Materials

We offer a long list of specialty materials and components; Metglas® amorphous metals, FINEMET® nanocrystalline materials and high-performance soft ferrites and ceramics.

Electric Wire & Cable

Contribute to more sophisticated social infrastructure

The Electric Wire & Cable Business Unit mobilizes its outstanding achievements and rich experience accumulated over the years to build a diverse range of wire products that improve the social infrastructure as well as products that support moves to decrease size and boost performance. The applications range from railway vehicles and port facilities to general construction and industrial processes. We provide customers with the optimum support by supplying these products.

Automotive Components

We address today’s needs for ever greater safety, energy efficiency, and convenience

Our sensors, power harnesses and brake harnesses and hoses are all developed and manufactured in a manner to fully utilize the characteristics of their materials and to meet market needs for efficient and reliable energy and signal transmission. They are globally sold and quality assurance satisfies our most demanding customers.
Hitachi Metals Group and CSR

Moving Forward as Society’s Trusted Partner

By creating value for our customers through our corporate activities, we hope to be able to contribute to solving social issues in a range of different areas. Furthermore, we will aim to earn our place as society’s trusted partner by taking responsibility for the impact exerted on the public by our corporate activities, and by addressing the needs of a variety of stakeholders.

Hitachi Metals Group Codes of Conduct (Summary)

All officers and employees of the Hitachi Metals Group shall act with sincerity and fairness in a highly ethical manner based on “obey the law and walk the path of virtue.”

1 Toward a Sustainable Society
   We will provide innovative solutions to society and integrate social and environmental responsibility into our business activities.

2 Sincere and Fair Business Activities
   We will act in compliance with legislation and sound corporate ethics, build fair and equal partnerships with suppliers, and ensure quality and safety of our products and services.

3 Respect for Human Rights
   We will promote our understanding of and respect for internationally recognized human rights and will not discriminate or engage in any acts that may impair self-dignity.

4 Building a Work Environment That Brings Out Employee Strengths
   Prioritizing health and safety above all else, we will promote sustainable growth of the organization and individuals.

5 Information Management and Communication
   We will manage personal and other information properly and respond to stakeholders responsibly through various means of communication.

6 Protection of Intellectual Property and Brand
   We will protect our own intellectual property, respect third-party intellectual property, and protect and enhance the value of the Hitachi Metals Brand.

7 Securing Corporate Assets
   We will use and manage our corporate assets properly to protect their value.

8 Crisis Management
   We will make concerted efforts in case of disasters and threats such as cyberattacks and terrorism.

9 Responsibilities of Employees
   Employees shall acknowledge and affirm their compliance with the Codes of Conduct. If they become aware of any non-compliant activity, they shall report it immediately.

10 Responsibilities of Top Management
   Top managers shall comply with the Codes of Conduct in business management. In the event of violation of the Codes, they shall swiftly take corrective measures and actions to prevent a recurrence of similar incidents.

Guidelines for CSR Activities

Hitachi Metals Group systematically established guidelines for CSR activities as follows:

The Company Philosophy governs all corporate activities of the Hitachi Metals Group. It also functions as the guiding principles of our CSR activities.

The Hitachi Metals Group Codes of Conduct is consist of rules and principles intended to assist officers and employees in making decisions and taking actions based on “obey the law and walk the path of virtue,” with our corporate creed and corporate philosophy as a foundation, in order to realize this Hitachi Metals WAY. It is a declaration to society concerning in which direction our Group should move forward and it also serves as the standard of our corporate ethics.

Laws and regulations are the basic rules of corporate activity. It should be noted, however, that they stipulate minimum requirements only.

Hitachi Metals Group aims to carry out its social responsibility and realize its management philosophy through the observance, by all directors and employees, of laws and regulations and the Hitachi Metals Group Code of Conduct, and their implementation of the Hitachi Metals Group Corporate Principles, in their daily duties.
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### Communication Symbol

The “Materials Magic” communication symbol is an expression of the overall value of the Hitachi Metals Group.

#### Materials Magic

- The red box is the source of the Group’s competitive strength.
- The yellow sections represent our technology and structure, enhanced by the ideas and actions of each individual.
- The base of the box is our corporate culture and the building blocks that constitute our DNA.
- Finally, the legs supporting the box itself are the efforts and abilities of each and every Hitachi Metals Group employee.

#### From a Customer Standpoint

“Materials” encompasses people, products, technologies, designs, ideas and services that solve problems and generate value. At the Hitachi Metals Group, we deliver optimal solutions that embody customer needs. This is what we call “Materials Magic.”

#### About Our Manufacturing Philosophy

As a development-driven company distinguished for its advanced technology and development capabilities, the philosophy of Hitachi Metals reflects a single-minded focus on quality. In relentless pursuit of the creation of quality, we will continue to deliver highly functional component materials that contribute to the wellbeing and prosperity of society. This, too, is “Materials Magic.”

#### Each and Every One of Us

Consolidating our wisdom and knowledge, the experience we have amassed over the years and all of the other “Materials” that we possess as an engine for growth, we will forge ahead in the 21st Century. This is yet another facet of “Materials Magic.”