



# SANYO SPECIAL STEEL

| Company profile |



# Pioneering the new era of steel



- 1 Headquarters
- 2 No.1 Technical Research Laboratories
- 3 No.2 Technical Research Laboratories
- 4 150-t Steelmaking Plant
- 5 Billet Mill
- 6 Small and medium Bar Rolling Mill
- 7 Wire Drawing Shop
- 8 Eastern Tube treatment Line
- 9 Large Bar Inspection Line
- 10 60-t Steelmaking Plant
- 11 No.1 Metal Powder Plant
- 12 No.2 Metal Powder Plant
- 13 5,000t forge plant
- 14 Warehouse
- 15 Assel Mill
- 16 Bar steel inspection plant
- 17 No.2 Cold Pilgering Shop
- 18 Hot Extrusion Mill
- 19 Large Bar Rolling Mill
- 20 No.1 Cold Pilgering Shop
- 21 Fabrication Department Mill
- 22 Precision Forging Department East Mill
- 23 Precision Forging Department West Mill

## Corporate Philosophy Confidence-based Management

### ■ Confidence of Society

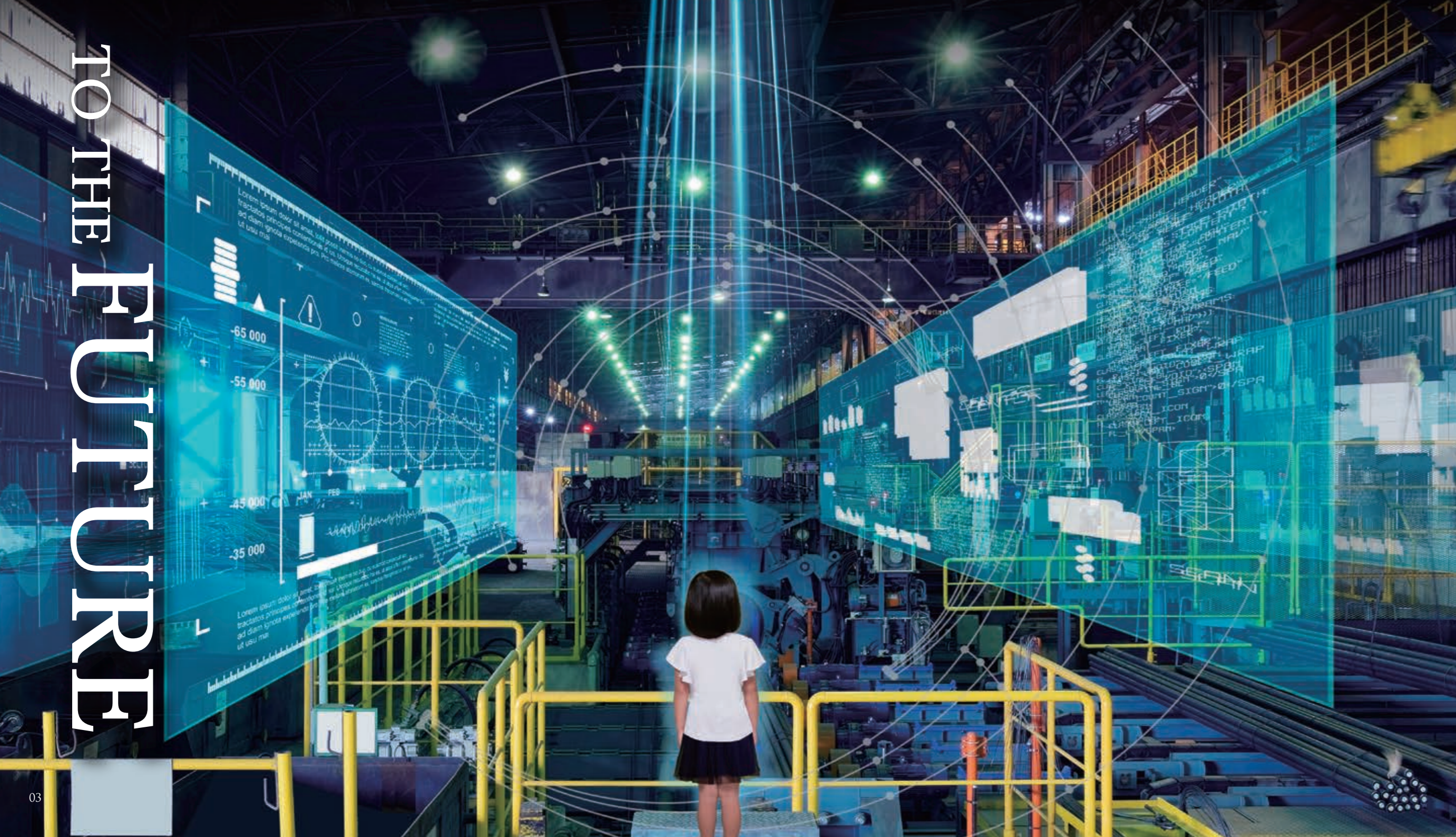
We aim to acquire the confidence of society by contributing to the realization of an affluent and culturally rich society and fulfilling our social responsibilities through our "high-quality special steel manufacturing."

### ■ Confidence of Customers

We aim to earn the confidence of customers by rapidly ascertaining exactly what their needs are and providing them with high-quality special steel products.

### ■ Confidence among People

We aim to build the confidence among people by deepening communication with all of our stakeholders and acting autonomously in conformity with social norms.



## Our pride in special steel

Special steel brings a lot to the table, including its abundance as a resource, the ease of recycling it, and the diversity of its material properties.

The special steel products that we create have supported industrial and economic progress and have been a part of people's everyday lives.

Special steel has a variety of properties that make it useful as a core component in automobiles, robots, and even in the medical sector, and once it has fulfilled its purpose, it is recycled in the electric arc furnace steelmaking process to be reborn again and again.

Special steel is an essential ingredient to realize a sustainable society. As a manufacturer of special steel, with its infinite potential, we will continue to forge ahead with our heads held high.



**Superior ability to serve our customers, achieved through a tripolar structure**  
 We have built a global network centered on our integrated special steel manufacturing hubs in Japan, Europe, and India. Through this network, we can accurately identify customer needs in various areas of the world and then provide a stable supply of high-quality products out of our manufacturing hubs.

**Greater potential through concentration of technical strength**  
 By combining new technology with the technology we've built up over many years in operation, we create products and processes that contribute to the future society.

**Promoting our brand globally**  
 Through close coordination between Group hubs, we are rapidly enhancing our brand value and making further strides forward toward earning global recognition for "Sanyo Special Steel - the Confident Choice."

# Leading the global special steel market

Sanyo Special Steel's world-class technical capabilities and our philosophy of steel are shared by our hubs throughout the world. With a collective potential of the entire Group, Sanyo Special Steel will bring "Steel You Can Count On" throughout the world.

**Integrated Special Steel Works**

- Japan:** Sanyo Special Steel Co., Ltd.
- Nordic:** Ovako AB
- India:** Mahindra Sanyo Special Steel Pvt. Ltd.

**Formed and Fabricated Materials Works**

- Japan:** Santoku Tech Co., Ltd.
- China:** Ningbo Sanyo Special Steel Products Co., Ltd.
- Thailand:** Siam Sanyo Special Steel Product Co., Ltd.
- Mexico:** Sanyo Special Steel Manufacturing de México, S.A. de C.V.

**Secondary Processing Works**

- Thailand:** SKJ Metal Industries Co., Ltd.
- Indonesia:** P.T. SANYO SPECIAL STEEL INDONESIA

**Sales Office**

- U.S.A:** SANYO SPECIAL STEEL U.S.A., INC.
- China:** SANYO SPECIAL STEEL TRADING (SHANGHAI) CO., LTD.
- India:** Sanyo Special Steel India Pvt. Ltd.

## “Steel You Can Count On”

that thrive in a variety of fields

Sanyo Special Steel’s “Steel You Can Count On” is incorporated and used in a variety of industrial products, including automobiles, railroads, construction machines, electronics products, and information communication devices. Sanyo Special Steel provides materials that offer high functionality and quality to support development of industry and society.

### Factories, Plants, Power Stations

#### Tool Steel

P/M high speed steel, Dies for forging press, Dies for high-quality plastics, Casting dies, Rolls, Tools, etc.

#### P/M high speed Steel

Cutting tools/dies, Screws for injection molding machines, etc.

#### High Alloy Steel Pipes

Extra-high-anticorrosion pipes, Desalination pipes, Pipes for heat exchangers, etc.

#### Bearing Steel Engineering Steel

Bearings, Linear Motion Bearings, Ball Screws/Tubes

#### Stainless Tubes

For refuse incineration and power generation boilers, Tubes for waste heat recovery, Chemical plant piping

#### Metal Powders

Heat-resistant thermal spray powder for boiler pipes

### Electrical Cables

#### High Alloy Cables

High-strength low thermal expansion alloy for high voltage transmission lines

### Wind Power Generation Equipment

#### Bearing Steel

Bearings

#### Engineering Steel

Bolts, Gears, etc.

### Railways

#### Bearing Steel

Bearings

### Robots

#### Bearing Steel

#### Engineering Steel

Driving parts, etc.

### Automobiles

#### Engineering Steel

Transmission gears, Shafts, Engine parts, Connecting rods, etc.

#### Bearing Steel

Bearings, etc.

#### Heat Resistant Steel

Intake/exhaust valves, etc.

#### Metal Powders

Brazing filler metal for heat exchangers, Shot peening

### Aerospace

#### Bearing Steel

#### Engineering Steel

#### Stainless Steel

Driving parts, etc.

### Construction machineries

#### Bearing Steel

#### Engineering Steel

Gears, Shafts, Cylinders, Sprockets, Swing gears, etc.

### Buildings

#### Bearing Steel

Seismic isolation systems

#### Engineering Steel

Bolts

### Space

#### Bearing Steel

#### Engineering Steel

#### Stainless Steel

#### Metal Powders

Driving parts, etc.

### Medical Fields

#### Stainless Steel

Parts for dental treatment devices (hand pieces)

### PCs

#### Stainless Steel

Motor shafts for OA equipment, Sleeves, etc.

### TVs

#### Metal Powders

Powder Metallurgy (P/M) Products

Magnetic head for HDD recorders, etc.

### Mobile phone, Smartphone

#### Metal Powders

Electro-Magnetic Absorber

### Ships

#### Engineering Steel

Shafts, Bolts, etc.

#### Heat Resistant Steel

#### High Alloy Steel

#### Stainless Steel

Propeller shafts, etc.

Engine valves, etc.

### Roads

#### Electric Arc Furnace Slag Products

Base course materials, Asphalt aggregates, etc.

## Specialty steel [Product overview]



[Examples of applications]  
Ball bearings

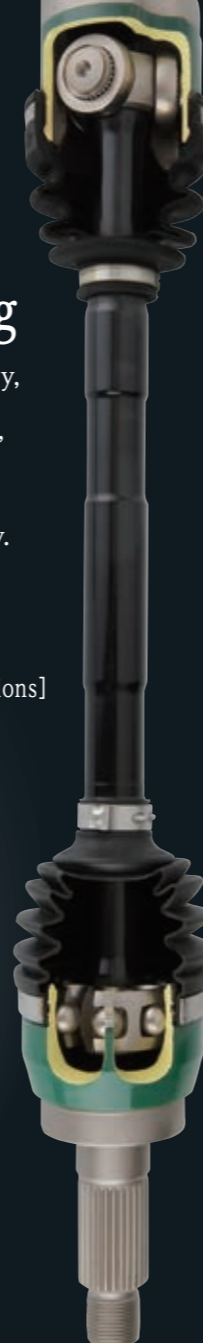
## Bearing Steel

### Top market share in Japan High reliability that supports Manufacturing

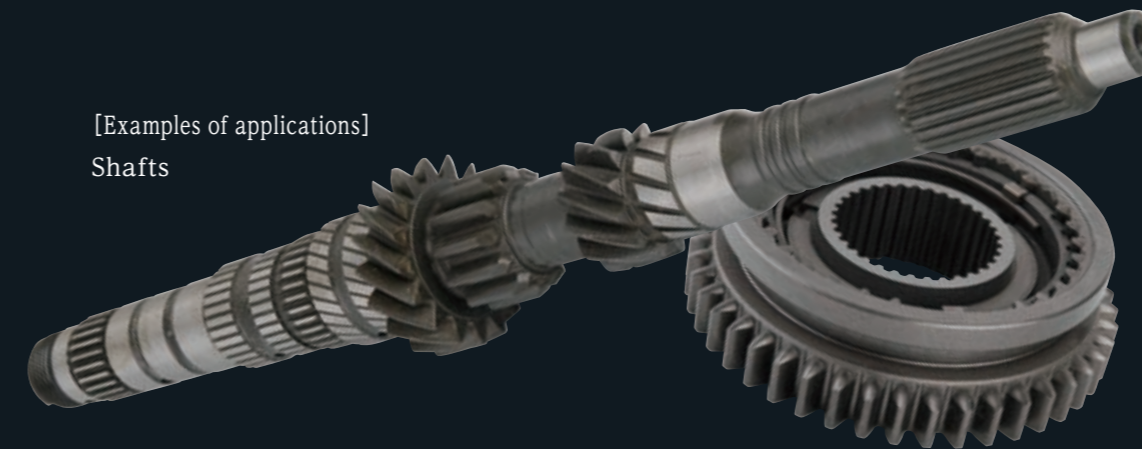
Bearings are used in the rotational structure of automobiles, industrial machinery, rail, wind turbines, and various other types of machines and equipment. These bearings are made from bearing steel, which excels in hardness, wear resistance, and fatigue strength. Sanyo Special Steel has spent many years working to improve the quality of our bearing steel, establishing our own original steel manufacturing and inspection techniques. Our bearings' cleanliness, which heavily determines the lifespan of a bearing, is simply unmatched in the industry. Sanyo Special Steel will continue contributing to the development of industry in the future by further improving the reliability of our steel.



[Examples of applications]  
Constant  
velocity joints



[Examples of applications]  
Shafts



[Examples of applications]  
Gears

## Engineering Steel

### Functionality that meets increasingly advanced needs

Engineering steel is a type of special steel with improved performance in terms of strength, toughness (tenacity), fatigue strength, and hardenability. It is used in important components of automobiles, construction machines, industrial machines, and more. Sanyo Special Steel has developed engineering steel such as the ECOMAX® series, which offers superior functionality and high strength without the use of precious alloy elements. We serve a wide range of needs for smaller, lighter, and more cost-conscious parts.

## Stainless Steel

### High performance used in a variety of scenarios

Stainless steel is resistant to corrosion and rust, and there is a diverse kind of steel products that can be made resistant to oxidation and heat etc. These steels are used in a wide range of products, from home appliances and electronics to plants and ships. Sanyo Special Steel is working to make effective use of our outstanding manufacturing technologies while developing cutting-edge steel products in our mission to attain ever-higher quality and functionality in our stainless steel.



[Examples of applications]  
Flange

## Heat and Corrosion Resistance Alloy

### Special characteristics to endure even harsh usage scenarios

Special materials that are used in extremely harsh environments that normal special steel could not endure (such as chemical and power plants) are called "Heat and corrosion resistance alloy". Sanyo Special Steel uses these alloys to serve a wide variety of customer needs by producing steels that offer superior performance, such as through nickel-based alloys that provide superior corrosion and heat resistance.



[Examples of applications]  
Fin tube

## Tool Steel

### Long product life to support production

Tool steel (used in dies and tools) is special steel that features high shock resistance, wear resistance, fatigue strength, and high-temperature strength. Sanyo Special Steel's preeminent manufacturing technology and advanced quality control enable us to produce tool steel with consistent, reliable functionality. We also produce tool steel as rolled bars, flat square bars, and steel tubes. These are used in the automotive industry and a variety of other manufacturing sectors, helping our customers to improve their production efficiency.

[Examples of applications] Punch



## The world's highest level of quality.

### High-quality special steel products with its hidden potential fully pursued

Special steel is used in particularly important components of automobiles, industrial machinery, plants, and other equipment. Moreover, the demand for special steel continues to evolve with the changing times, including its use to improve the functionality of finished products and reduce its environmental impact, and for applications in newly developed devices.

Drawing on our foundation of expertise in the production of high cleanliness steel, Sanyo Special Steel lives up to the trust and expectations that our customers place in us, providing a stable supply of steel crafted to respond to their changing needs.

# Offering world-leading quality

## Specialty steel [Manufacturing process]

# Trusted for our superior workmanship and manufacturing process

Sanyo Special Steel reliably produces high-quality special steel to satisfy a wide range of customer needs, using equipment and advanced technology that enables the production of steel with the highest level of cleanliness in the world, in addition to using rolling/forging equipment and steel tube manufacturing equipment. We also strive to reduce our environmental impact and conserve energy by making improvements to our equipment and facilities. In this, our goal is to become even more trusted by both the market and society.

### Steelmaking

Sanyo Special Steel utilizes two steelmaking plants to efficiently manufacture high quality special steel. Our main 150-t steelmaking plant consistently mass produces high quality special steel using a continuous and uniform manufacturing process, from melting scrap down to inspecting billets. Our 60-t steelmaking plant handles a variety of product types and small lots.



Electric arc furnace

Ladle furnace[LF]

RH vacuum degasser

Continuous caster

### Rolling | Forging

Sanyo Special Steel also owns a variety of rolling and forging equipment. We respond to the needs of our customers—such as size, shape, and application—with the most appropriate manufacturing process.



Cogging mill

Reducing and sizing block [RSB]

Forging machine

### Tube Manufacturing

Sanyo Special Steel is the only specialized manufacturer of special steel in Japan that has the facilities to manufacture steel tubes. We manufacture a wide variety of seamless steel tubes, using an assel tube rolling mill for standard steel including bearing steel, and using a hot extrusion press for stainless steel.



Assel tube rolling mill

Hot extrusion press

### Heat Treatment • Cold Working • Inspection

Secondary processes such as heat treatment and cold working further increase the added value of products to better serve advanced customer needs. We also give all our products a final inspection prior to shipment to further improve reliability.



Cold pilgering mill

Phased-array ultrasonic inspection machine

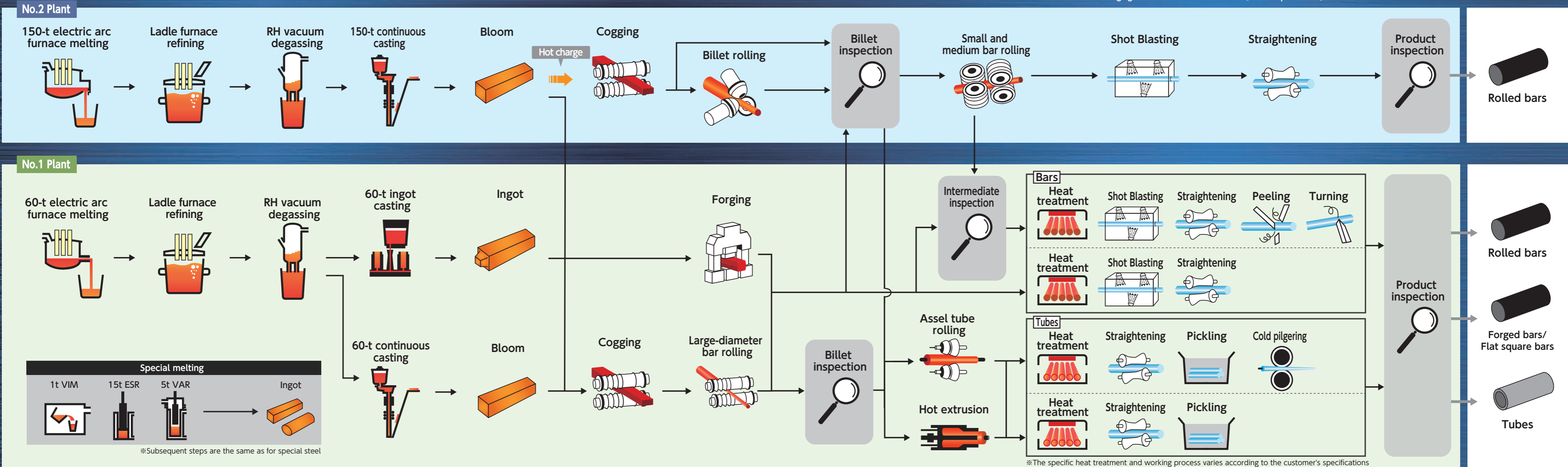
# Operation flow

## Main machine [Facility capacity]

No.2 Steelmaking plant (Production of crude steel) [93,000t per month]  
 No.1 Steelmaking plant (Production of crude steel) [40,000t per month]

Large bar rolling machine [35,000t per month]  
 Small & medium bar rolling machine [79,000t per month]  
 Forging machine [8,500t per month]

Assel tube rolling mill [12,000t per month]  
 Hot extrusion press [1,800t per month]





# Formed and Fabricated Materials



Hot ring rolling machine



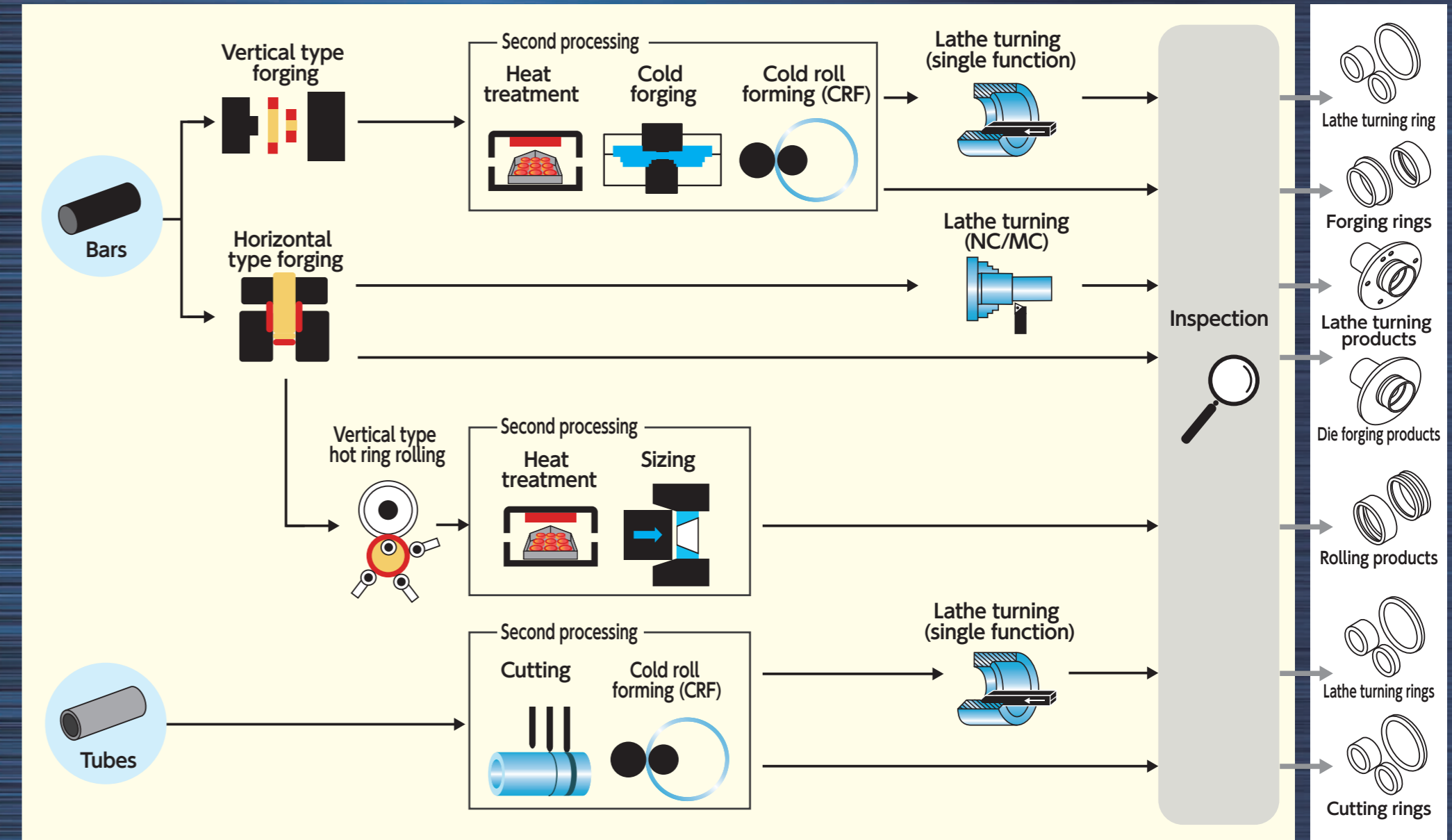
Horizontal type forging machine

# High-quality formed and fabricated products that serve global needs

Formed and fabricated materials are steel products worked into nearly finished product forms. They are widely used as semi-finished products for bearings and automobile parts. Utilizing our unique technology, Sanyo Special Steel manufactures high-cleanliness steel that is used as a base to produce formed and fabricated materials through the process best suited to the material properties. This helps our customers to simplify their working processes and improve yields. We have manufacturing and processing sites for formed and fabricated materials throughout the world. We rapidly provide high-quality formed and fabricated material products to meet the needs of our customers.



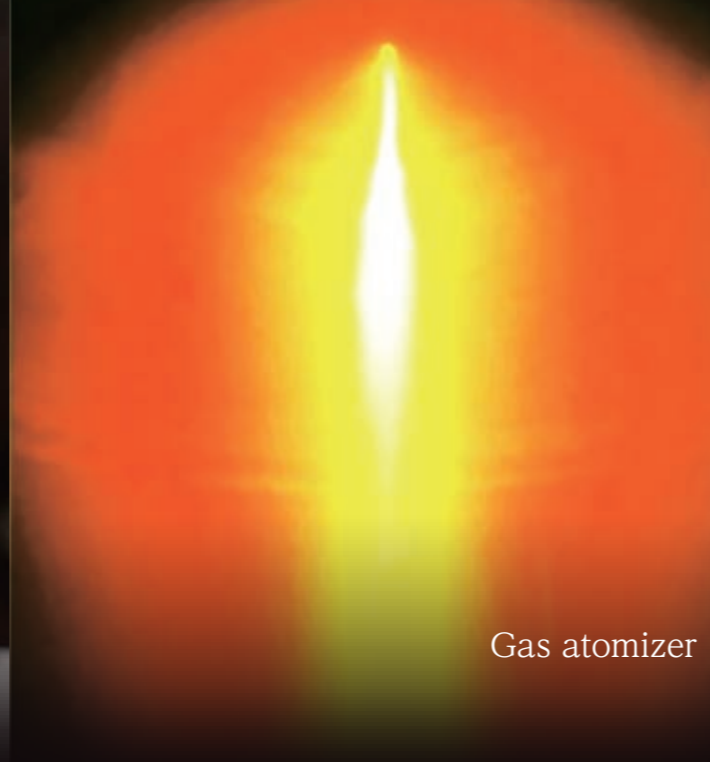
## Operation flow



**Metal Powders/  
Powder Metallurgy Products**



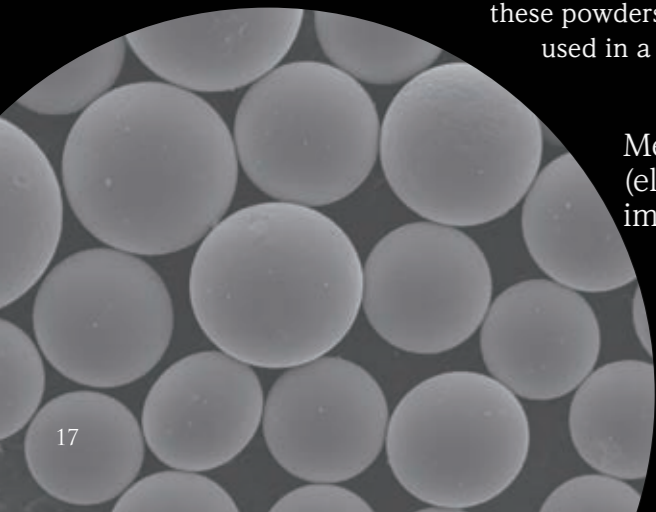
Example of moldings  
by 3D printing



Gas atomizer

# High-functionality material that underlies cutting-edge technological development

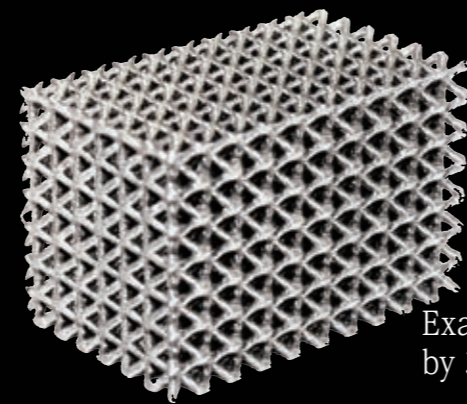
Metal powders offer a high level of component design freedom, and it is said that the powder form offers limitless possibilities. In addition to high-quality metal powders with few impurities and superior fluidity, Sanyo Special Steel manufactures powder metallurgy products from these powders using unique molding techniques. We contribute to the production of high-functionality, high-performance products used in a variety of situations—from the forefront of research and development to manufacturing sites.



Metal powders  
(electron microscope  
image)

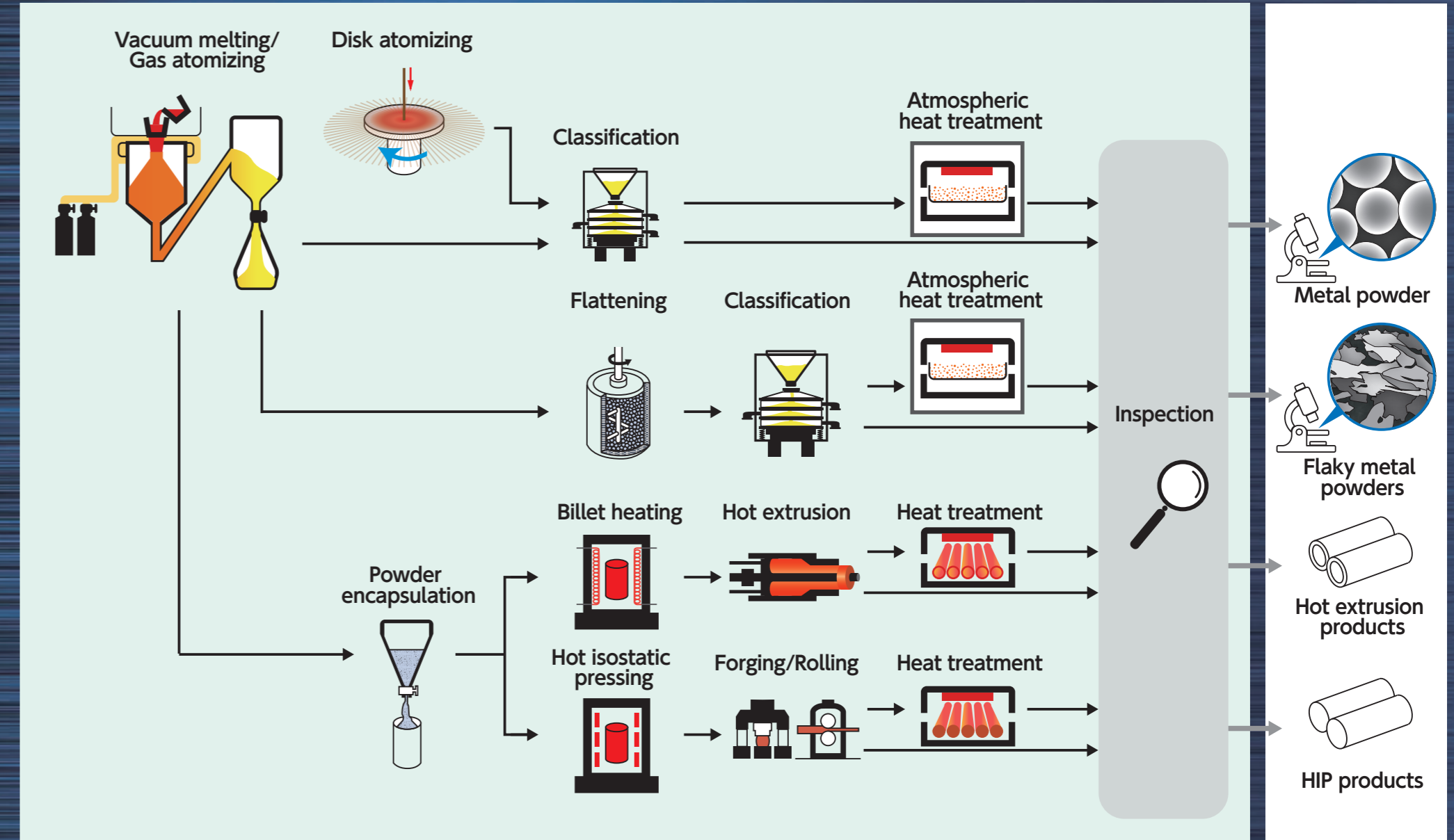


Sputtering targets



Example of moldings  
by 3D printing

**Operation flow**



# Unlocking special steel

## Our unstoppable inquiring spirit is creating the future of steel

Sanyo Special Steel analyzes trends in rapidly changing social systems and achieves accurate, rapid research and development. We explore the true potential of steel, based on our core “high-cleanliness steel production technology” and with the aim of building our brand strength in the global market.



### Investigating core principles with a focus on product characteristics

All of our technology is based on the core principles. Now more than ever before, it is essential that we enhance our core research to more thoroughly investigate those core principles, given today's demands for ever more advanced product characteristics and mass-production technology. The researchers gazing down at the microscopic level have their focus on the performance of the final product.

### Serving needs from a multilateral approach

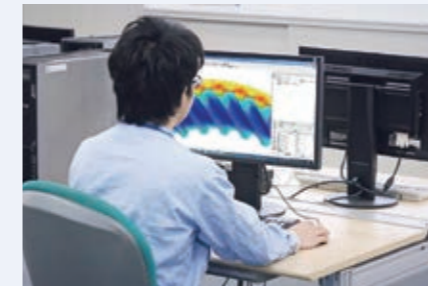
As the pace of technological progress accelerates, customer needs are becoming increasingly diverse and sophisticated. We look from the customer's perspective to identify those qualities and characteristics that are the true key to progress and work on these to optimize our steel from its composition and structure through to production. We are exploring the very limits of steel's potential.

### Earning trust through sophisticated evaluation and analytical techniques

When it comes to special steel, even slight differences in composition can impact the characteristics of the material. The progress of evaluation technology—making the invisible visible and the unknown known—is the source of new knowledge and the basis for the trust placed in us. R&D that incorporates cutting-edge evaluation technology earns people's trust in steel.

Ongoing efforts focused on the future

We aim to achieve ever more innovative technology through research and development across all fields and to continually, rapidly produce new technologies and highly reliable products with an eye to global expansion.



ADVANCE THE STEEL

# Masterful workmanship and Organizational strength

## We create “Sanyo Special Steel - the Confident Choice”

It is people who constitute the foundation of manufacturing.  
Each and every staff member sustains the “Sanyo Special Steel - the Confident Choice” brand.

### Nurture people and nurture the organization

Sanyo Special Steel works to nurture its human resources so that all staff members can realize their full potential. In addition to everyday education, personnel are also given group training sessions and support for self-development. At manufacturing sites, there are systems in place to ensure that skills are passed on by efficiently teaching skills and techniques to younger workers.

Furthermore, real organizational strength is essential in manufacturing. Sales staff from regional and branch offices pick up on customer needs and work closely with other divisions to reflect those needs in research and development and production sites, thereby achieving stable product supply and day-by-day growth.



#### Sales

We accurately identify customer needs and propose ways to maximize the benefits for both our customers and the company. Customers' requests are fed back to the Research and Development and Technology Management divisions with the ultimate goal of further building customer trust.

#### Production

We work with the Sales division to reliably produce high-quality products. Moreover, we always strive to improve facilities' operational processes in pursuit of better quality and productivity.

#### Research & Development

Through collaboration with the Sales division, we are working to both serve customer needs and engage in research and development on new technology and products with a long-term, future-oriented perspective.



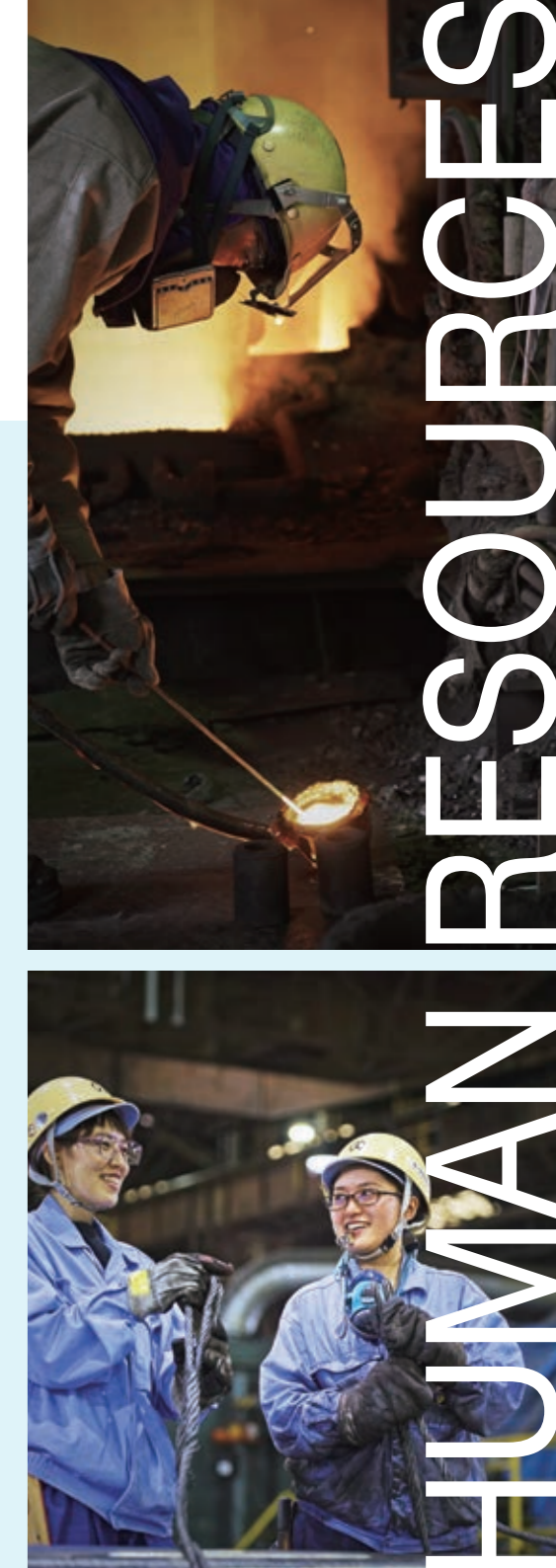
#### Quality assurance

We are working to improve the accuracy of product inspections and materials testing, to build and manage quality management systems, and to otherwise ensure and improve quality in a multilateral way so as to further enhance our customers' trust in us.



#### Technical administration

We collaborate with other divisions to design more efficient manufacturing processes and repeatedly implement improvements in pursuit of higher quality. Additionally, we work to standardize manufacturing processes and technology in order to provide a stable product supply.



Aiming to increase corporate value



Activities to foster the development of human resources responsible for the next generation: Elementary school student factory tour

Staff clean the area around the head office plant: Volunteer activities to beautify the local area



Recycling 100% of slag from electric arc furnaces: Contributing to a resource-recycling society



Providing customer solutions through new technological development

# Our mission as a member of society

Companies are members of society and they cannot develop without confidence from their stakeholders. By executing "Confidence-based Management" in a simple and honest way, the Sanyo Special Steel Group will achieve sustainable growth and contribute to the realization of a sustainable society.

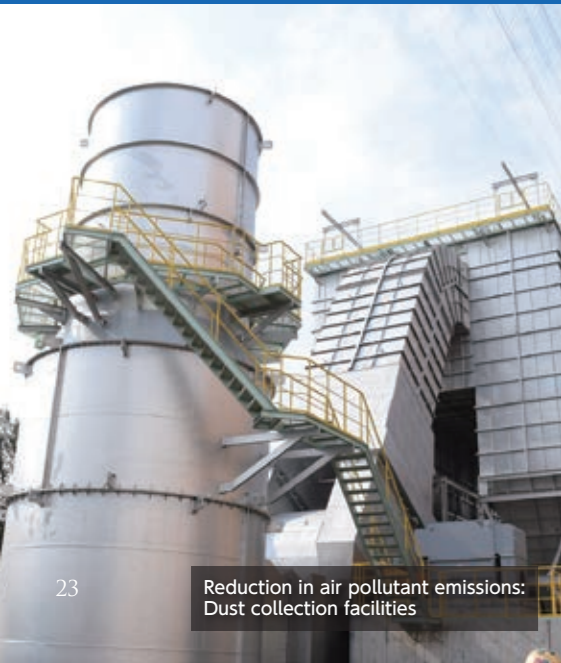
Realization of a sustainable society



## Sanyo Special Steel's Initiatives for Sustainable Growth

Stakeholders	Activities
Customers	<ul style="list-style-type: none"> <li>Stable supply of high-quality products</li> <li>Sustainable efforts to improve quality</li> <li>Promotion of technology and research on steel</li> </ul>
Business partners	<ul style="list-style-type: none"> <li>Fair and equitable trading</li> <li>Sustainable procurement activities</li> </ul>
Shareholders & investors	<ul style="list-style-type: none"> <li>Appropriate disclosure of financial information</li> <li>Communication with shareholders and investors</li> <li>Promotion of prompt and transparent management</li> </ul>
Local communities	<ul style="list-style-type: none"> <li>Regional revitalization both in Japan and overseas</li> <li>Support activities for volunteer/cultural promotions</li> </ul>
Employees	<ul style="list-style-type: none"> <li>Development of work-friendly environments</li> <li>Training for international personnel</li> <li>Eradication of occupational accidents</li> <li>Improvement of disaster prevention awareness</li> </ul>
Environment (the planet)	<ul style="list-style-type: none"> <li>Development of environmentally friendly products and technologies</li> <li>Efforts towards environmental preservation</li> </ul>

# Accumulating trust



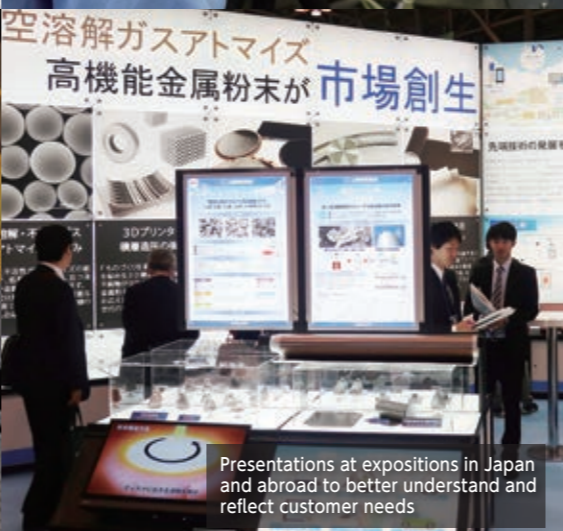
Reduction in air pollutant emissions: Dust collection facilities



Activities promoting local sports: track & field sessions with the Track and Field Club



Ongoing initiatives to enhance quality and an improved quality assurance system



Presentations at expositions in Japan and abroad to better understand and reflect customer needs



Recitals by elementary and junior high students, hosted by the Sanyo Special Steel Cultural Promotion Foundation



Initiatives to reduce CO<sub>2</sub> emissions: Using regenerative burners for heating furnaces

## SDGs-related initiatives

At the same time as playing our role in this resource-recycling society, Sanyo Special Steel Group manufactures materials that serve as the foundation of industry. For that reason, we believe that our primary mission should be to work hard at our own line of business in order to contribute to social and economic development. We have also taken on the task of addressing global challenges based on the SDGs, which have been adopted as sustainable development goals for the world at large.

Group Activities	SDGs goals
<ul style="list-style-type: none"> <li>Development and stable supply of highly-functional special steel products</li> </ul>	
<ul style="list-style-type: none"> <li>Health and safety activities</li> <li>Development of employees' skills</li> <li>Welfare scheme</li> </ul>	
<ul style="list-style-type: none"> <li>Support for the active participation of women</li> </ul>	
<ul style="list-style-type: none"> <li>Utilization of scrap raw material</li> <li>Recycling of by-products</li> </ul>	
<ul style="list-style-type: none"> <li>Promotion of energy saving</li> <li>Reductions in CO<sub>2</sub> emissions</li> <li>Modal shift</li> <li>Increase the ratio of transportation made by ship</li> </ul>	
<ul style="list-style-type: none"> <li>Prevention of water pollution</li> <li>Re-use of waste water</li> </ul>	
<ul style="list-style-type: none"> <li>Reductions in the emission of air pollutants</li> <li>Development of green spaces within factory sites</li> <li>Chemical substance controls</li> </ul>	



For more information on our CSR activities, see the Sanyo Special Steel Report on our website.

# We Promise

Corporate Philosophy: Confidence-based Management



## Toward the realization of a sustainable society

Since our founding in 1933, the Sanyo Special Steel Group has worked under the corporate philosophy of “Confidence-based Management” to contribute to the well-being of society and the achievement of a resource-recycling society.

In the present day and indeed in the future, as the structure of society and industry both undergo tremendous change, special steel products will continue to play a major role as a basic building block of society, and customer needs will continue to rise even further. In the future, the Group will continue to work on forward-looking technologies and build up trust in the “Sanyo Special Steel - the Confident Choice” brand, sparing no effort over the long term. As we take one step at a time toward achieving sustainable growth, we will continue to contribute to the realization of a sustainable society.

Representative Director and President Shinya Higuchi



