Steel Business

Responding to new needs with advanced steel and an evolving workforce

We refine steel with advanced technologies and respond flexibly to changing needs as a company valued by society.

Steel's power to respond

Steel has supported the development of civilization with its unparalleled advantages, including relatively low manufacturing costs, suitability for mass production, tremendous strength, easy processing, and easy recycling. Going forward, I believe that expectations for steel will increase as the world continues to undergo dramatic changes. Steel's power to respond is evident, for example, in thin but strong high strength steel that is helping to reduce the weight of electric vehicles and construction materials that are enabling customers to save labor in response to Japan's shrinking workforce. JFE will continue to provide new value and respond flexibly to ever-changing needs by developing products and technologies that leverage steel's infinite potential.

The driving force behind such initiatives is our highly competitive production system, which is consolidated into two large-scale steelworks in east and west Japan. By continuing to make strategic investments in our domestic manufacturing bases, we aim to dramatically increase our productivity and enhance our cost competitiveness. Furthermore, the technological and quality capabilities that we nurture in Japan are also being applied to our overseas operations. We promote our global strategy of new investment and use of raw materials from overseas sources to ensure our sustainable growth in the face of declining demand in Japan. We acknowledge the serious concern we caused to our stakeholders due to a series of problems in our blast furnaces in FY2018. We are thoroughly investigating the root causes, and taking permanent measures in response utilizing cutting-edge AI, IoT technology, and other advanced IT.

Flexible workforce and a willingness to accept challenges

To bring out the full potential of steel and contribute to society, diverse human resources are essential. In order to respond to dramatic global changes with flexibility and speed, JFE aims to be a dynamic company where employees can energetically take on new challenges. Technologies are being passed down to younger workers through the application of AI and IoT, which is facilitating the transfer of on-site skills and expertise, one of the sources of our strength in manufacturing.

Strategies to Realize Value Creation

Business Overview

JFE Steel is an integrated steel manufacturer that possesses world-class production scale and advanced capabilities for technological development. The company supplies steel products that meet the diverse needs of global customers.

Competitive production centered on two large-scale steelworks

The production bases of JFE Steel consist of two large coastal steelworks—the East Japan Works comprising the Chiba and Kehin districts and the West Japan Works comprising the Kurashiki and Fukuyama districts. The company also operates the Chita Works specializing in steel pipes and the Sendai Works to produce steel bars and wire rods. JFE Steel’s highly efficient and competitive production system makes extensive use of leading-edge technologies for the manufacture and sale of high-quality steel products. The Steel Research Laboratory adhering each production base develops new products to bring out the potential of steel as well as innovative production processes with consideration to the global environment, while also researching core technologies to support such works.

Global supply system that fully responds to worldwide steel demand

JFE Steel has actively built up a global supply system in response to growing demands for steel, especially in Asia. In recent years, the company has prioritized automotives, energy and infrastructure materials and has expanded operations into Mexico (steel sheets for automobiles), the UAE (pipes for pipelines) and Myanmar (thin steel sheets for construction material). JFE Steel leverages its advanced technologies and expertise cultivated in Japan to sell high-quality steel materials that respond to local needs, further expanding the presence and reach of the JFE brand.

FY2018 Results

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Strengthening manufacturing capabilities

As a part of the company’s focus in FY2019, we will continue to develop manufacturing bases for steelworks and other works in Japan, which is one of the core strategies for the Sixth Medium-term Business Plan. Through measures to increase capabilities and optimize performance centering around West Japan Works, the company will drastically strengthen its manufacturing capabilities. Upgrading our facilities with a view to future growth, we will establish stable production and reduce costs, and secure even greater competitiveness, while making greater progress in increasing our capabilities and developing/manufacturing high-grade steel.

Previous initiatives to ensure stable operation

The previous Medium-term Business Plan invested in large-scale facility upgrades including renovation of coke ovens. These enhancements of manufacturing bases bring stability to production, promoting an early recovery of the company’s manufacturing capabilities. The Sixth Medium-term Business Plan continues to develop manufacturing bases while planning and implementing capital investments in even greater scale than the previous Medium-term Business Plan. The West Japan Works and the Kurashiki district aim to increase capabilities and optimize performance through initiatives such as the installation of a new continuous casting machine. Development of innovative production processes will also be expected, focusing on upstream processes such as use of lower-priced raw materials. Furthermore, superiority in total costs will be thoroughly pursued by improving the productivity of both people and machinery through active use of advanced IT such as AI and IoT Technologies, as well as core system renovations at steelworks as implemented from the previous Medium-term Business Plan, which will be brought into operation in phases.

These initiatives will achieve stable production of 30 million tons of crude steel while reducing costs on the scale of 105.0 billion yen over three years. The greater stability in production will put the recovery on track and will enhance our manufacturing capabilities, making it stronger and more sold. Furthermore, as a key initiative for this fiscal year following the problem with blast furnace operations in the previous fiscal year, we have established a system to prevent troubles by identifying hidden risks and applying preventive measures to all districts. In terms of machinery and equipment, sensing technology is steadily being introduced in order to quickly detect and promptly respond to any faults during blast furnace operations. In addition, work is also progressing on the creation of an operator assistance system utilizing AI concurrent with thoroughgoing training of operators, to support any lack of experience.

Domestic capital investment for the Sixth Medium-term Business Plan

IFRS: 1 trillion yen level
3 years (Japanese standards: 850.0 billion yen)

Difference between the Japanese standards and the IFRS is the wider scope of non-current assets.

Major initiatives

- Investment to increase capabilities and optimize performance
  - Installation of a new continuous casting machine in Kurashiki, etc.
  - Achieve a non-consolidated 30 million ton production of crude steel
- Strategic investments pursuing cost advantages
  - Increase capability of the sintering machine in Fukuyama, etc.
- Implement permanent measures to ensure blast furnace stability
  - Installation of new facilities for stability, and active use of AI and IoT Technologies

<table>
<thead>
<tr>
<th>District</th>
<th>Facility</th>
<th>FY2017</th>
<th>FY2018</th>
<th>FY2019</th>
<th>FY2020</th>
<th>FY2021</th>
<th>FY2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>No. 6 Coke oven (Battery B)</td>
<td>Operational in June 2019</td>
<td>Establish self-sufficient structure for coke</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Fukuyama</td>
<td>No. 3 Coke oven (Battery B)</td>
<td>Second half of FY2019 (to be operational)</td>
<td></td>
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</tr>
<tr>
<td>Fukuyama</td>
<td>No. 3 Coke oven (Battery B)</td>
<td>Second half of FY2021 (to be operational)</td>
<td></td>
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<td></td>
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<tr>
<td>Fukuyama</td>
<td>No. 3 Sintering Machine</td>
<td>Second half of FY2019 (to be operational)</td>
<td>Establish 30 million ton production</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kurashiki</td>
<td>No. 7 Continuous Casting Machine (New continuous casting machine)</td>
<td>Second half of FY2019 (to be operational)</td>
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<tr>
<td>Kobe</td>
<td>Renovation of the Ogishima thermal power plant</td>
<td>Second half of FY2019 (to be operational)</td>
<td></td>
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</table>

Initiatives for stable operation of blast furnaces

- Progressively undertaking development of manufacturing bases including measures to enhance the stability of blast furnaces on the scale of 10 billion yen.
- Upgrades in the medium- to long-term, to enable sustainable growth. Further efforts are aimed at increasing capabilities and enhancing competitiveness, including a new continuous casting machine in the Kurashiki district introducing the latest technology to achieve both quality and efficiency.
Engineering Business

Evolving the engineering business with the mission to “Create” and “Ni·na·u” - the foundation for life

The company is steadily making progress on achieving the key initiatives of the Sixth Medium-term Business Plan, to expand our operating businesses and increase earnings of our overseas businesses. We will transform and strengthen our business structure, focusing on the development of infrastructure that supports people’s lives as the core of our business.

Establish a stable profits base

JFE Engineering has expanded its operating businesses to “Ni·na·u” - the foundation for life, through traditional EPC (engineering, procurement, and construction) as well as Public and Private Partnership (PPP) business, recycling business, and power generation and electric power businesses. In January this year, we began full-scale operation as an energy service provider to supply power and heat to factories in private sectors. In April, as a joint venture with the TEPCO Group, we launched the biggest waste treatment and recycling company in the Tokyo metropolitan area. Thus our operating businesses are steadily expanding. During the current Medium-term Business Plan, we will increase the volume of incoming orders in operating businesses including O&M (operation and maintenance) to 50% of the total, establishing a business structure whose performance is largely unaffected regardless of whether or not major project orders are obtained.

Expanding overseas business and strengthening profitability

JFE Engineering has as its mission expanded the development of infrastructure deeply rooted in everyday life, building its business in areas such as waste-to-energy and water treatment plants, and bridge construction. For JFE Engineering to grow even more, we must make the most of our technologies honed in Japan, decisively making inroads into overseas markets, particularly in the growth region of Asia. In order to achieve this, we have built up a structure capable of expanding our business, actively engaging in M&As and reinforcement of our overseas bases. As a result, the number of local staff has expanded to approximately 1,600 employees. Each overseas base has grown to take over not only design work but also engineering work like procurement and project management.

Such efforts have been rewarded with success, as overseas orders in FY2018 reached the highest ever figure since our founding of over 70.0 billion yen, including a water treatment plant in Vietnam and bridge construction in India. By making the maximum use of our global engineering structure and thoroughly strengthening pre- and post-order project management via the new project management unit established in April last year, we will ensure that profit is generated from the steady inflow of orders.

Business Overview

JFE Engineering’s core business is the construction of essential infrastructure, including waste-to-energy plants, water treatment plants and bridges. By focusing on these business fields, we propose integrated services that include business planning, and operating business covering from EPC (engineering, procurement, construction) to the O&M (operation and maintenance) stage.

Waste-to-energy plants
Recycling industrial waste, food and consumer appliances
Water treatment plants (water and sewage)
Water pipelines
Natural gas treatment plants
LNG bases
Pipelines
Energy service provider
Waste management and recycling business are merged with Tokyo Waterfront Recycle Power Corporation of TEPCO Group. The photo shows Tokyo Waterfront Eco Clean.

The Global Remote Center monitors plants at 66 bases. It is the central hub for operating business.
A water treatment plant ordered in Vietnam. It is currently in the trial operation stage.

**From FY2018, the JFE Group adopted the International Financial Reporting Standards (IFRS) in place of the generally accepted accounting principles (JGAAP) adopted previously.**
The JFE Group is engaged in a broad range of businesses from steel materials, machinery, non-ferrous metals, chemicals and ships to food and electronics, with our focus on steel products. The company provides services that add value to supply chain operations with a global network encompassing 95 companies.

**Trading Business**

Increasing our abilities to offer proposals and convey information, aiming to be a trading company with presence

As the JFE Group’s core trading company, we constantly consider the overall optimum, sharing strategies with other Group companies to work on strengthening functions. Furthermore, we seek to increase our abilities to offer proposals and convey information, growing sustainably with our customers to be a company with strong market presence.

**Shipbuilding Business**

Winning the customers’ trust with technological capabilities, human resources, and performance

In order to meet the expectations of our customers for “vessels with superior performance at the market price,” in April this year we established a new division Production Center, aiming to integrate the management of all the fabrication line in separate locations. Leveraging these, in combination with our environmental and energy conservation technologies honed over many years, to boost competitiveness in terms of both performance and costs, we are adding higher value for merchant vessels such as tankers, bulk carriers, and container ships. We will also aggressively take up the challenges of new fields in ocean development, such as the manufacture of self elevating platform (SEP) for offshore wind power turbines.

**Business Overview**

Japan Marine United was launched in 2013 on the merging of two leading companies in the Japanese shipbuilding industry, Universal Shipbuilding Corporation and IHI Marine United. The company is active in four fields: merchant vessels, naval ships, marine engineering, and ship’s life cycle, with powerful development and design capabilities backed by a wide-ranging track record in shipbuilding.

**FY2018 Results**

- **Net sales / Revenue** (billion yen): 2,060.0, 1,907.9, 1,671.0
- **Ordinary income / Segment profit** (billion yen): 21.8, 33.0, 31.5
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- **Vessels built** (vessels): 35.7, 40.0, 39.0
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President & CEO, Japan Marine United Corporation
Kotaro Chiba

1. 14,000-TEU container ship “ONE COLUMBA”
2. Floating Offshore Substation “FUKUSHIMA KIZUNA”
3. Large passenger/car ferry “SUNFLOWER KIRISHIMA”
4. Hakone Sightseeing Cruise “Queen Ashinoko”
**Business Strategy for the Automobile Market**

Establish a strong presence through leading-edge technology and global supply network in the face of changing market needs.

The JFE Group’s medium-term business plan is regarding automobiles, infrastructure materials and energy as the three major fields, and forging ahead with technological development and global expansion in these areas. In particular, taking this substantial changes in market needs occurring in the automobile industry, described as being in a once-in-century transformation, as a major opportunity, we are expanding our business for the automobile industry. The company further differentiates ourselves by rolling out cutting edge technology and services globally.

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- Strategy 2: Capturing the electric vehicle market with cutting-edge electrical steel sheets
- Strategy 3: Global rollout matched to customer needs and market expansion
- Strategy 4: Satisfying multiple needs via a broad product lineup and collective Group power

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**Business overview of the automobile market**

JFE Steel, as a force supporting car manufacturing, has expanded its business globally by focusing on developing products and application technologies for automobile steel, based on its consistent quality and supply. As the environmental regulations in various countries become increasingly tougher, JFE Steel is now marketing to develop products to match changes in society, such as ultra-high strength steel for weight reduction, and electrical steel sheets for drive or dynamic motors in electric vehicles.

**JFE steel sales percentage for automotive industry**

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>29.0%</td>
</tr>
<tr>
<td>2015</td>
<td>12.0%</td>
</tr>
<tr>
<td>2020</td>
<td>7.0%</td>
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</tbody>
</table>

**The business environment for the automobile market**

Production numbers of vehicles are expected to continue to grow, primarily outside Japan. The company is expanding its local supply systems in growing markets.

**Breakdown of world steel consumption**

- **Agriculture**: 10.0%
- **Construction**: 45.0%
- **Shipbuilding**: 3.0%
- **Machinery**: 15.0%
- **Electrical appliances**: 10.0%
- **Energy**: 10.0%

**Trends in global production (millions of vehicles)**

- **North America**: 10.0
- **Europe**: 20.0
- **Asia**: 30.0

**Global ownership of electric vehicles (millions of vehicles)**

- **Plug-in hybrid vehicles (passenger cars)**
- **Plug-in hybrid vehicles (commercial cars)**
- **Electric vehicles (commercial cars)**
- **Electric vehicles (passenger cars)**
- **Electric vehicles (commercial cars)**

**CO2 emissions regulations (g/km)**

- **2020**: 117 g/km
- **2025**: 97 g/km

**The relationship between fuel efficiency and vehicle weight**

Increasingly tougher environmental regulations in various countries will cause changes to the drive system and powertrains of cars, centering on electric vehicles.

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*1: Calculated as a 15% reduction vs. 2021 (95g/km) in the draft proposal.
*2: Actual figures up to 2014 for Japan and the USA, and up to 2015 for India, China, and the EU. Figures are in NEDC mode.

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**The percentage of the company’s sales for automotive industry is more than double the demand rate for general automobile sales.**
The use of high strength steel in vehicle parts is an effective measure to increase their collision safety while also improving fuel efficiency at a low cost through weight reduction. However, high strength steel, is difficult to form or weld under standard automobile parts manufacturing methods and conditions. In some cases the required quality or performance as parts cannot be attained, limiting the materials strength and applicable parts that can be used.

JFE Steel independently researches and develops the so-called “application technology” to process and weld the steel sheets from its perspective as a materials manufacturer, which leads to the development of the best materials to suit the diverse needs of our customers. We intend to expand the scope for use of high strength steel through leveraging the accurate materials designs and application technology solutions that other manufacturers would struggle to match.

### A broad lineup of steel sheets for automobiles in pursuit of usability
JFE Steel maintains strong competitiveness and expands profitability by rapidly brings to the market high strength steel that the company has developed and manufactured by leveraging the most advanced technology in response to the needs of weight reduction of automobiles. Our high strength steel is suited for weight reduction of any kinds of parts, including for frames contributing to collision safety, for panels with superior flexibility and ease of processing, as well as for the suspension. We also develop GI-JAZ, which provides a better friction coefficient for galvanized iron (GI) coating used widely by US and European automobile manufacturers, and expand its sales.

### UNIHITEN™
UNIHITEN™ is high strength steel with a tensile strength grade of 440 MPa for thinner outer sheets like for doors and hoods achieving both superior surface quality and dent resistance for formed panel parts, thanks to low-yield strength, high work-hardenability, and bake-hardenable ability. It is in mass production for cold rolling and GA, and is employed as hood outer material for Toyota’s JPN-TAXI.

### GI JAZ™
This product applies the lubrication facilitating technology developed with JAZ™ (JFE Advanced Zinc) high lubricity hot-dip galvannealed (GA) steel sheets to galvannealed (GI) steel sheets, which are commonly used by US and European manufacturers. More stable press formability is gained through the excellent slipability.

### 1470MPa-grade cold-rolled/ GA high strength steel
1470 MPa-grade cold-rolled high strength steel, formed through cold forming at room temperature, has the world’s highest tensile strength for automobile parts. Commercialized for bumper reinforcement, it has future potential for use in frame parts. We have also completed development of GA high strength steel with the same tensile strength. Several automobile companies are looking to make use of this material.

### Providing solutions applying high strength steel (EVI)
JFE Steel has been developing its own application technologies to make the best use of high strength steel for manufacturing automobile parts. Application technologies, used for manufacturing parts for automobile manufacturers, are categorized into design, forming, welding, and other categories. The company accurately understands the needs of customers to supply our development technologies to them via a process called Early Vendor Involvement (EVI). The result is a win-win relationship where the company secures and expands sales of newly developed products centering on high strength steel, while its customers achieve further weight reduction and stability in manufacturing processes.

### System supporting business for the automotive industry
The CSL (Customers’ Solution Lab.) is an exhibit and experiment combined study center established in the China district in order to conduct joint research working as a team with customers and researchers of the Steel Research Laboratory. Over the total of 5,000 people from 1,200 companies have visited since its establishment in August 2005, leading to new joint development on multiple themes. The Customers’ Center Fukuyama was established in the Fukuyama district in October 2014 so that customers in west Japan in diverse sectors including automobiles, shipbuilding, construction and energy can interact directly with the JFE Group’s latest technologies. JFE Steel leverages these bases to offer powerful support to our customers employing high strength steel.

JFE Steel has adopted the quality management system in accordance with ISO 9001, and has obtained the international standard IATF 16949 certification for the West Japan Works, a JFE Steel’s primary manufacturing base for automotive steel sheet. With this as the foundation, we respond to the needs of customers. The company has built a solid quality assurance system through use of its independently developed manufacturing technology and sensors for process monitoring, as well as through product testing utilizing high-precision testing and inspection equipment.

<table>
<thead>
<tr>
<th><strong>Feature</strong></th>
<th><strong>Strategy</strong></th>
<th>Expanding sales of high strength steel via unique solutions combining materials and application technologies</th>
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</thead>
</table>
JFE Steel’s newly developed proprietary technologies serve various needs, from reducing vehicle weight to improving vehicle comfort and design qualities while reducing manufacturing man-hours for our customers, continuing to be “JFE — the company always chosen by our customers.” Shifting to new materials such as aluminum and carbon fiber is gaining attention in recent years, but steel retains its place as the primary material. JFE Steel has accumulated the vast store of knowledge about automobile structure, and this has enabled us to combine steel with other materials (multi-material), creating new value to steel sheets.

### Examples of development with JFE’s proprietary application technology

**1. Topology optimization**

Topology optimization technology is an analytical method that retains the necessary elements to satisfy the characteristics required in the given design space, to find the most efficient distribution of materials. JFE’s topology optimization technology incorporates the design space (the space where the particular part will be allocated) into a section of the vehicle for analysis, to form the optimum shape for the parts which effectively improve the collision safety with less weight.

This technology was used as a design method for the shaping of parts for SUZUKI MOTOR’S Swift Sport, and to determine the areas to apply structural adhesives for MITSUBISHI MOTORS’ OUTLANDER PHEV Si Edition and other cars.

**2. New spot welding technology**

Spot welding joins overlapping steel sheets placed between two electrodes by applying heavy current to melt them together at that point. It is most commonly used in the assembly of automobiles. However, the more widespread use of ultra-high-strength steel in cars in recent years has brought difficulties to construction management of spot welding, placing limits on the design of vehicle structures.

In order to solve these technological challenges, JFE Steel developed J-MAC Spot™ welding, Pulse Spot™ welding, Single-Side Spot™ welding, and Intelligent Spot™ welding. Such technologies are contributing to greater use of ultra-high-strength steel.

**3. New forming technology (stretch preforming)**

We are developing new forming technologies employable for parts difficult to process. Among these, the stretch preforming technology makes it possible to process difficult shapes by optimizing the shape in the first stage of the standard two-stage press working. It can be applied to, regardless of the strength of the steel, from soft steel to ultra-high-strength steel, helping to improve the performance and design qualities of all types of parts while also reducing the weight.

This forming technology has successfully been employed to create an air spoiler integrated back door, demonstrating the potential for manufacturing low-cost parts with high design qualities.

**4. Supporting multi-material**

We propose multi-material structures incorporating lightweight materials like resins so that customers can achieve the goals of further reduction in vehicle weight, and thus we are contributing to weight reduction of vehicles.

Newly developed doors were designed using our independently developed topology optimization technology. Optimal arrangement of Mitsubishi Chemical’s fiber-reinforced resin inside the steel sheet door panel has made it possible to achieve both the improved panel rigidity and substantial light weight due to the thinner panels. By combining steel with other materials in this way, we work to offer even greater performance and ways to reduce weight, and maintain and expand the applicability of steel sheets.

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### Strategy 2 Capturing the electric vehicle market with cutting-edge electrical steel sheets

About 20% of Japan’s CO₂ emissions come from automobiles. Reducing such emissions has been a vital issue.

Automobile companies are working urgently to improve the fuel consumption of gasoline-fueled cars while at the same time, developing hybrid electric vehicles (HEVs), electric vehicles (EVs), and fuel cell vehicles (FCVs).

JFE Steel’s non-oriented electrical steel sheet is used by major automobile manufacturers as a core material in these motors that are the central element of electric vehicles, helping to make them more compact and efficient.

**Core strategies**

1. The adoption of electric vehicles will expand the demand for high-grade electrical steel sheets that allow smaller yet more efficient motors.

2. The ultra-thin electrical steel sheets developed by JFE Steel are designed to achieve low iron loss, and so making motors more efficient. Working together with JFE Shoji Trade, JFE Steel has established a broad global supply network and a high-powered service system.

3. By using our strengths to capture more and more of the growing electric vehicle market, we are expanding our business and contributing both to our customers and to a sustainable society.

**Characteristics required for electrical steel sheets**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>High density</th>
<th>High efficiency</th>
<th>Strength or rigidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low iron loss</td>
<td>Reduction of iron loss</td>
<td>Reduction of iron loss</td>
<td>High density or rigidity</td>
</tr>
<tr>
<td>High magnetic flux density</td>
<td>High power of iron core</td>
<td>Reduction of copper loss</td>
<td>Strongly magnetizing core</td>
</tr>
</tbody>
</table>

Electric motors work through an electrical current which flows through the copper wire wound around the edge of the first core (the stator) which rotates the second core (the rotor), causing the motor to rotate.

The problem is that the motor efficiency decreases due to the generation of heat caused by the current flow through the copper wire (copper loss) and the magnetic flux generated in the iron core (iron loss).

If magnetic flux is easily generated in the core (high magnetic flux density), the core becomes a powerful magnet, generating a strong torquing force (high torque).

From this, the two characteristics that are required for electrical steel sheets used in motor cores are low iron loss and high magnetic flux density.

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**A product lineup satisfying diverse needs**

For lower iron loss of non-oriented electrical steel sheets suited to motors, adding silicon (Si) is effective, but it has the disadvantage of lowering the magnetic flux density.

JFE’s JNE series solves this problem with a higher magnetic flux density than our previous JN series, and so has achieved a fine balance between the magnetic flux density and iron loss, greatly contributing to a much more technically challenging.

The characteristics required for motors for electric vehicles in recent years have consistently become more and more advanced.

In order to meet all these demands, JFE Steel works to differentiate itself from the competitors by commercializing the JNP series with an even higher magnetic flux density, as well as the thin-gauge JNE series which gives even lower iron loss, to meet the requirements of electric vehicles with world-class performance.

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**Feature**

**01**

Business Strategy for the Automobile Market
The JFE Group has actively expanded its business to other countries, centering on Asia in particular, to capture the growing demand for steel. We will also establish a base in Mexico in order to tap into the vast North American market. The advanced technologies and expertise cultivated in Japan allow us to provide high quality steel materials adapted to local needs at the right times.

Main measures

Asia

- We are capturing growing markets by actively constructing new manufacturing lines and capital participation in local mills.
- New lines are going into operation in 2019, to gain access to the growing North American and Mexican markets.

Mexico

- JFE Steel has entered into a comprehensive partnership for automobile steel sheets with AK Steel and ThyssenKrupp AG, to bring JFE’s cutting edge technologies to customers in the U.S. and Europe.
- Through coordination with JFE Shoji Trade, JFE Steel has established an integrated supply chain from production to distribution.
- Group companies are also accelerating their expansion overseas, with various merchandise such as iron powder, steel pipes, and more.

USA/Europe

- JFE Steel has entered into a comprehensive partnership for automobile steel sheets with AK Steel and ThyssenKrupp AG, to bring JFE’s cutting edge technologies to customers in the U.S. and Europe.

Group coordination

- The JFE Group—Always chosen by our customers

Strategy ▶ Global rollout matched to customer needs and market expansion

Strategy ▶ Satisfying multiple needs via a broad product lineup and collective Group power

With access to product lineup of not just high strength steel sheets and electrical steel sheets but also steel pipes, stainless steel, steel bars and wire rods and iron powder, as well as the non-ferrous products and components of other Group companies, JFE Steel meets various needs including greater performance such as car’s ride quality, reduced costs and greater productivity in the manufacturing processes of our customers.