Business Briefing about Our Products for Semiconductor Production Equipment

(Our high-performance stainless steel business)

Daido Steel Co., Ltd. (Securities code: 5471)

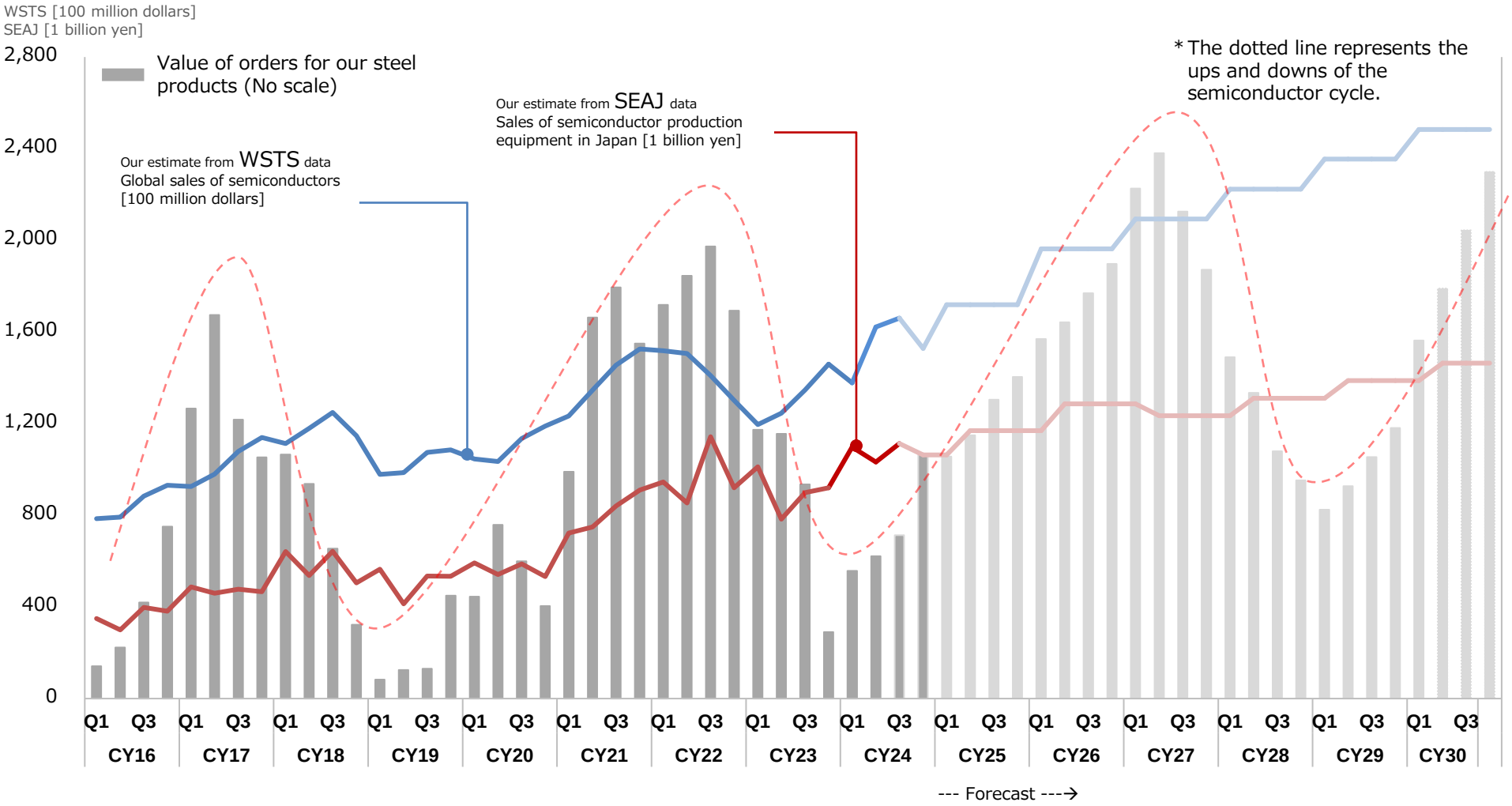
January 15, 2025

DAIDO STEEL CO., LTD.

DAIDO STEEL GROUP
Beyond the Special

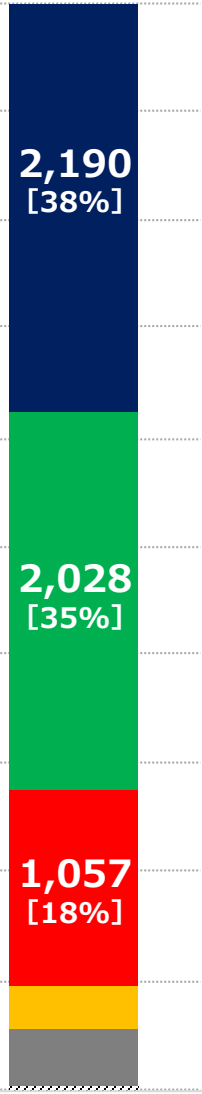
1. Semiconductor Demand and Orders for Our Related Products

The demand for semiconductors and semiconductor production equipment is expected to increase from 2026 to 2030. Orders for our semiconductor-related products are also expected to increase in line with market expansion.



* WSTS: World Semiconductor Trade Statistics
* SEAJ: Semiconductor Equipment Association of Japan

2. Sales by Segments and Semiconductor-related Products



Sales: 100 million yen

(FY2023 results: Japanese GAAP)

Specialty steel products

Production and sale of **structural and tool steel products** used mainly for automotive and industrial equipment parts

High-performance materials and magnetic materials

Production and sale of **stainless steel and superalloy steel products**, **magnetic products**, **titanium products**, and metal powder materials used for manufacturing automotive and industrial equipment parts and electrical and electronic parts.

Parts for automobile and industrial equipment

Production and sale of die forgings and fabricated materials for manufacturing automotive and industrial equipment parts.

Engineering

Production and maintenance of steel manufacturing-equipment, industrial furnaces, and equipment related to protecting the environment, etc.

Trading and service

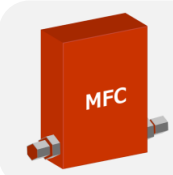
Real-estate business and service businesses such as employee welfare

Stainless steel, superalloy steel, steel bars

→ Valves

→ Joints

→ MFC



Stainless steel, superalloy steel, wire rods

→ Gas filters

→ Fasteners

→ LM guides

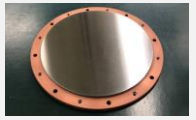
Stainless steel, superalloy steel, strip steel

→ Bellows

Stainless steel open-die forgings

→ Gas supply line pipes

High-purity target materials



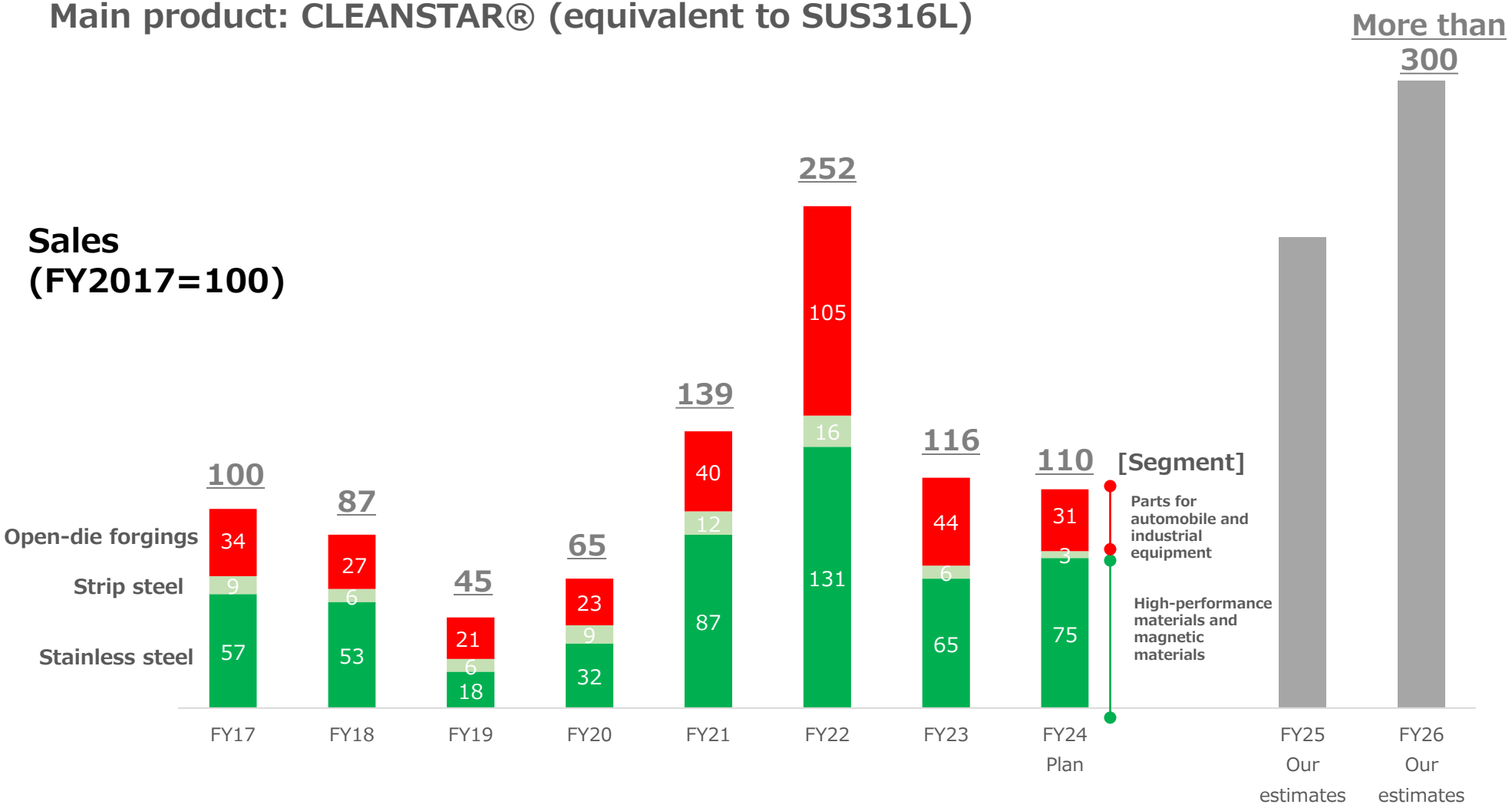
LED

Stainless steel powder

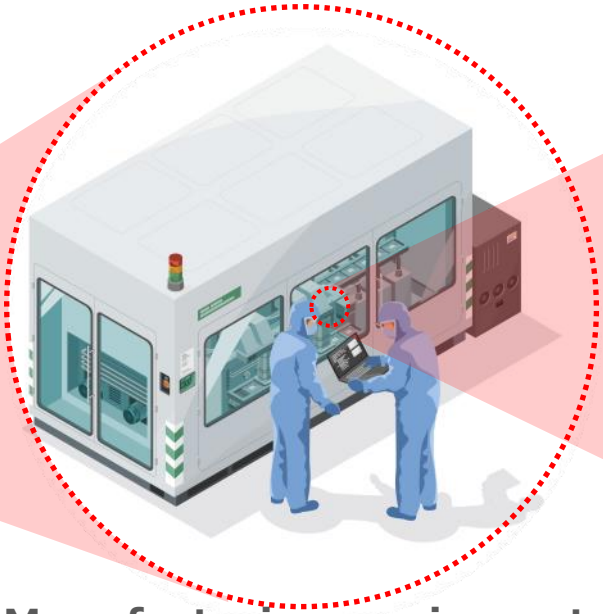
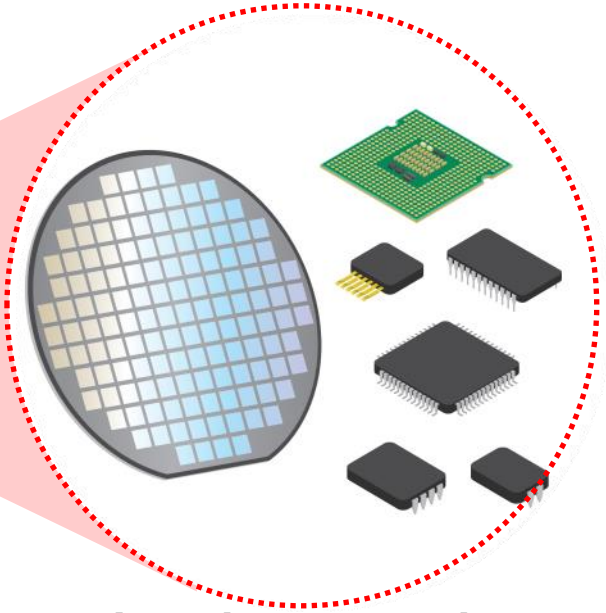
3. Sales Trends for Semiconductor Production Equipment (non-consolidated basis)

- The sale of semiconductor production equipment products is expected to more than triple in FY2026 over FY2017 sales.

Main product: CLEANSTAR® (equivalent to SUS316L)

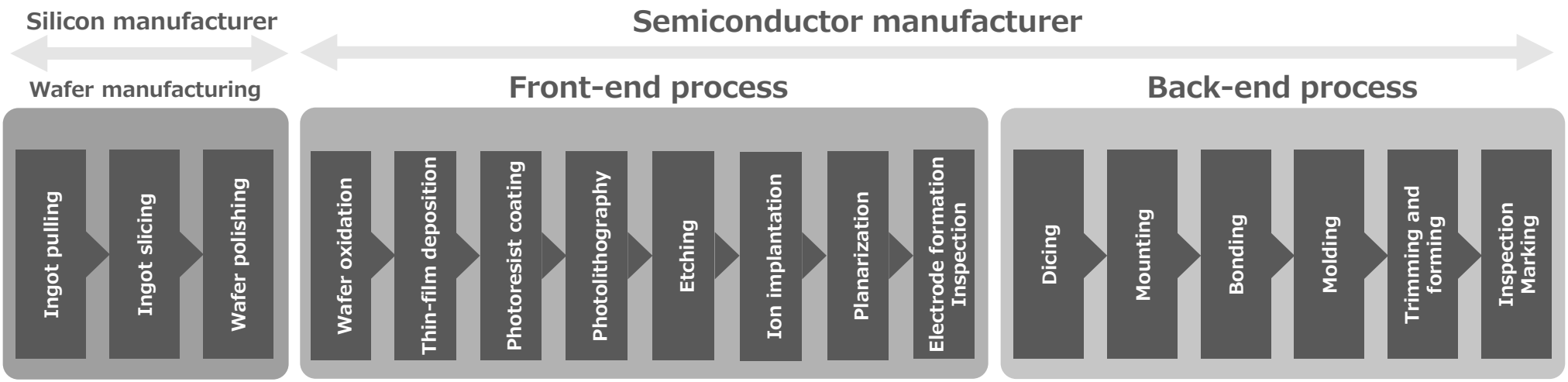


4. Specialty Steel Applications in the Semiconductor Industry

	Factory infrastructure	Manufacturing equipment	Semiconductor products
Targets	 OIL REFINERY		
Uses	**Parts for automobile and industrial equipment** Gas supply line pipe	**Piping-related products (valves, joints, bellows)** **MFC (Mass Flow Controllers)** **Gas filters** LM (Linear Motion) guides Encoders (LED) Fasteners	**High-performance materials and magnetic materials** Power semiconductors - Ni junction layers Semiconductor and electronic components - Ti barrier layers - Ni alloy wiring protective layers

5-1. Overview of the Semiconductor Production Process

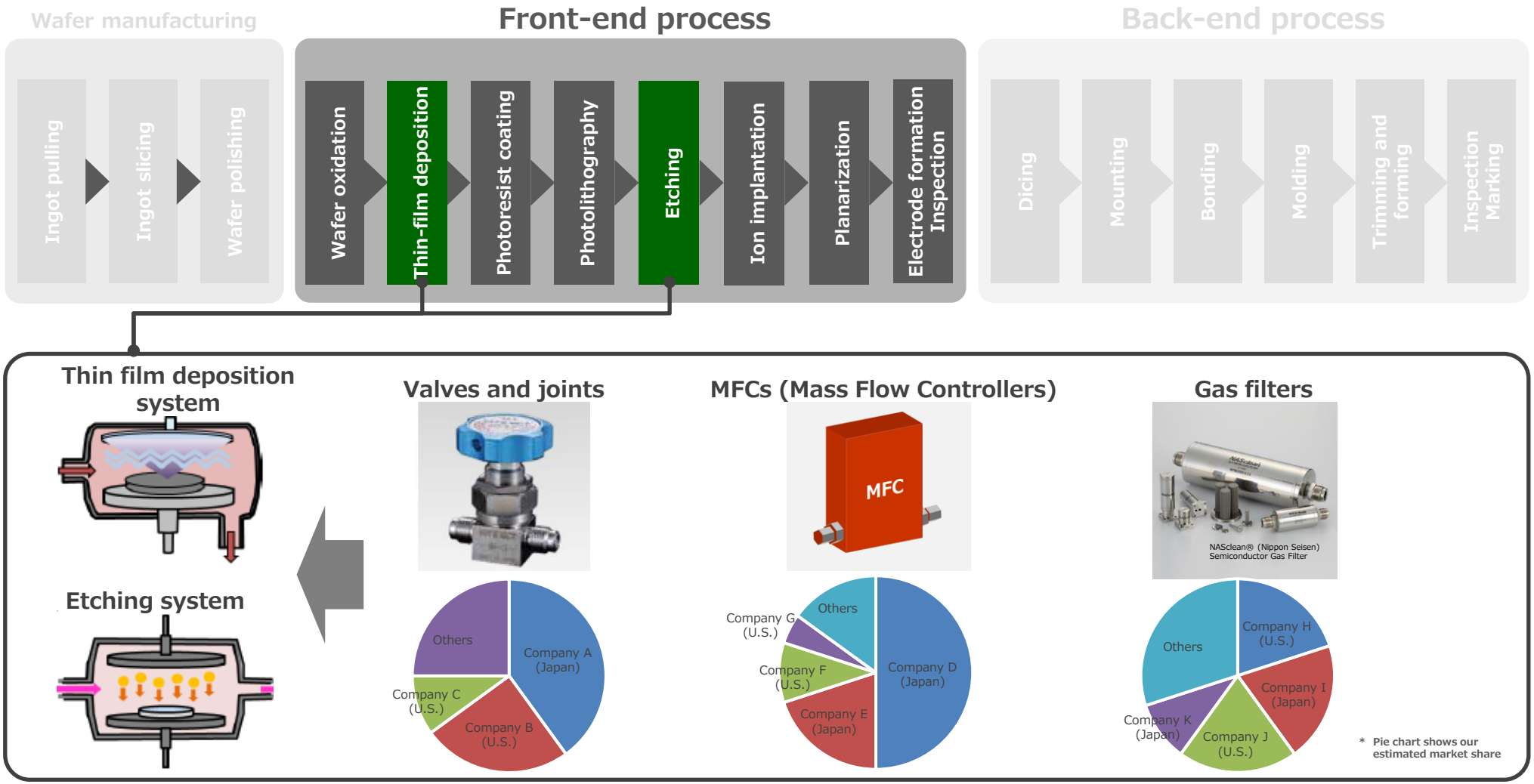
Three major processes contribute to the manufacture of semiconductors:



Production processes	Outline of the separate processes	Required steel characteristics: Corrosion resistance (Resistance to corrosion, especially from corrosive gases)	Surface cleanliness (Cleanliness of the steel's surface Very low level of impurities)	Low levels of thermal expansion (Limited expansion and contraction due to changes in temperature)
Wafer manufacturing	The process of producing silicon wafers, wherein high-purity silicon ingots are created, sliced and then polished		○	○
Front-end process	This is where a silicon wafer is prepared, making it ready to serve as a substrate for the formation of electronic components that will perform functions such as power control, signal amplification, and data storage.	○	○	
Back-end process	This is where a wafer with electronic components formed on it is cut (diced) into individual chips, which are then packaged as finished products.			○

5-2. Our Business Opportunities in the Front-end Process

- **Corrosive gases are used by equipment that performs thin film deposition and etching in the front-end process**
  - Corrosion-resistant stainless steel and superalloy steel are used because they can withstand these corrosive gases -



5-3. Our Business Opportunities within the Overall Process

Various component parts of the semiconductor factory infrastructure and the manufacturing equipment

- Stainless steel is widely used to make gas supply lines and semiconductor production equipment components -

Wafer manufacturing

- Ingot pulling
- Ingot slicing
- Wafer polishing

Front-end process

- Wafer oxidation
- Thin-film deposition
- Photoresist coating
- Photolithography
- Etching
- Ion implantation
- Planarization
- Electrode formation Inspection

Back-end process

- Dicing
- Mounting
- Bonding
- Molding
- Trimming and forming
- Inspection Marking

Daido Steel's products are used extensively throughout the entire semiconductor manufacturing process.

Gas supply line pipe

Our VIM-VAR steel pipes have a high market share in the field of corrosive gas supply lines, etc.

LM guides

Our long-life stainless steel (DSR7) has a high market share, for use as a material to make LM guides for various types of equipment.

Fasteners

Daido Steel's 316L wire rods and steel bars are widely used as a material for making fasteners (for example, nuts and bolts).

Bellows

Bellows manufactured using stainless steel and superalloy strip steel are also included as parts for semiconductor production equipment.

* VIM: Vacuum Induction Melting furnace, VAR: Vacuum Arc Remelting furnace

6. Our Stainless Steel Products for Semiconductor Production Equipment ①

Introducing CLEANSTAR®

*SEMI Standards: These international standards are used in the semiconductor industry. They were established by Semiconductor Equipment and Materials International (SEMI).

Product overview

- CLEANSTAR®, a super-clean stainless steel developed by Daido, meets JISG4303 and SEMI F20(*) international standards.
- High-level cleanliness & optimized chemical composition provide superior corrosion resistance, compared to Type 316L.
- Three steel grades, to suit the particular manufacturing process in terms of application and required characteristics.

Steel grades	Main process	Typical major components (mass%)					
	Primary / Secondary	C	Mn	S	Ni	Cr	Mo
CLEANSTAR-A	VIM / VAR	0.006	Extremely low Mn	Extremely low S	14.7	16.7	2.2
CLEANSTAR-B	AF / VAR	0.007	Low Mn	Extremely low S	14.7	16.7	2.2
CLEANSTAR-C	AF / -	0.015	1.8	Low S	12.1	16.7	2.0
Type 316L		0.030 or less	2.00 or less	0.030 or less	12.00 to 15.00	16.00 to 18.00	2.00 to 3.00

Process selection according to required characteristics (Please see page 11)

Reduced elements that adversely affect corrosion resistance

Manufacturing technology

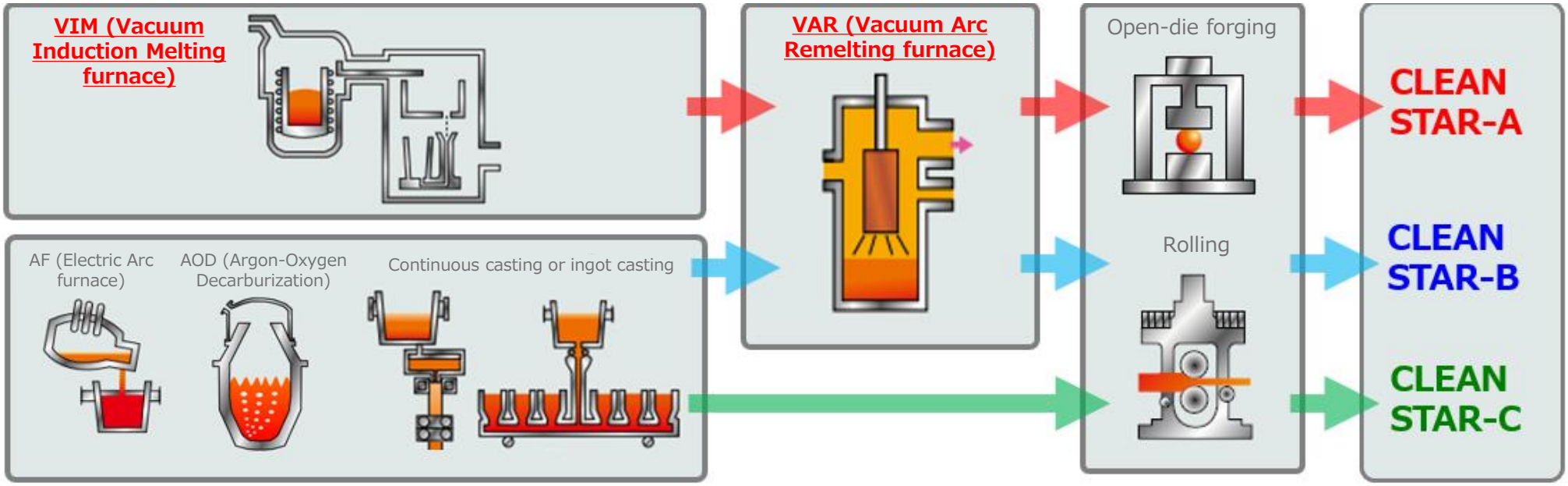
- Inclusions that may cause the admixture of foreign matter into a product have been minimized through the use of technology we cultivated as a manufacturer of aircraft materials and ultrafine metal wire.
- Elements that can undermine corrosion resistance have been minimized through our unique chemical composition design and manufacturing processes.

CLEANSTAR® is widely used as a material for semiconductor production equipment parts that are used where corrosive gases flow.

* VIM: Vacuum Induction Melting furnace, VAR: Vacuum Arc Remelting furnace

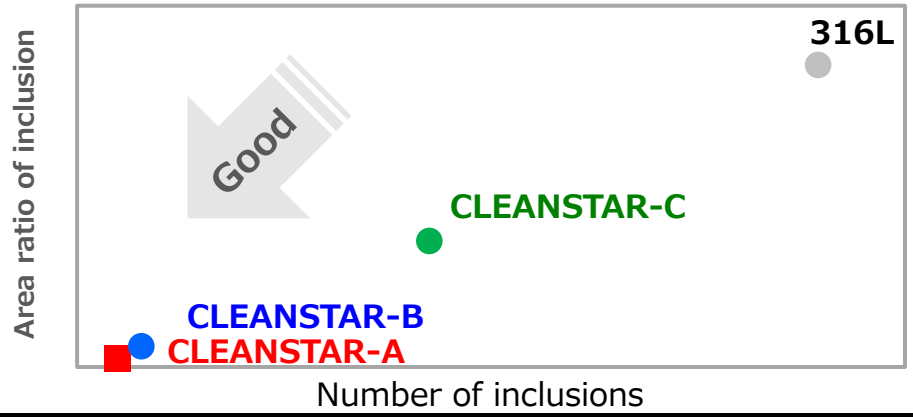
6. Our Stainless Steel Products for Semiconductor Production Equipment ②

Process [Primary melting - Refining - Casting] [Secondary melting - casting] [Forging / rolling] [CLEANSTAR]

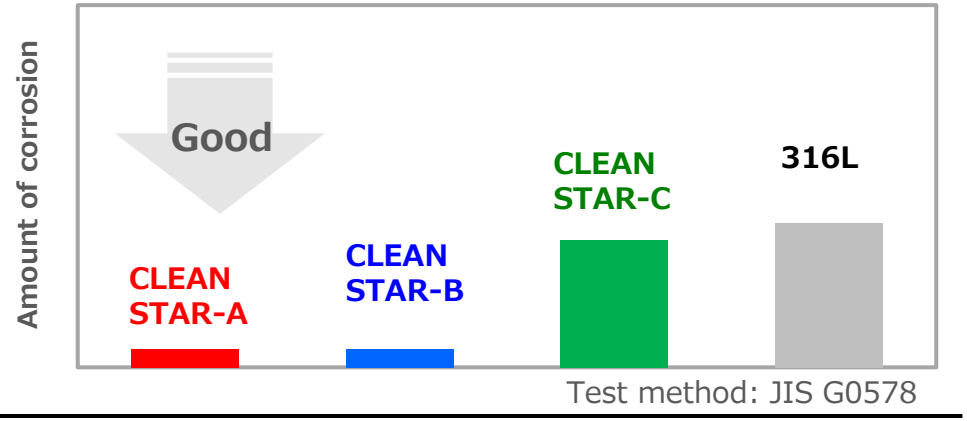


Main characteristics

[Cleanliness]



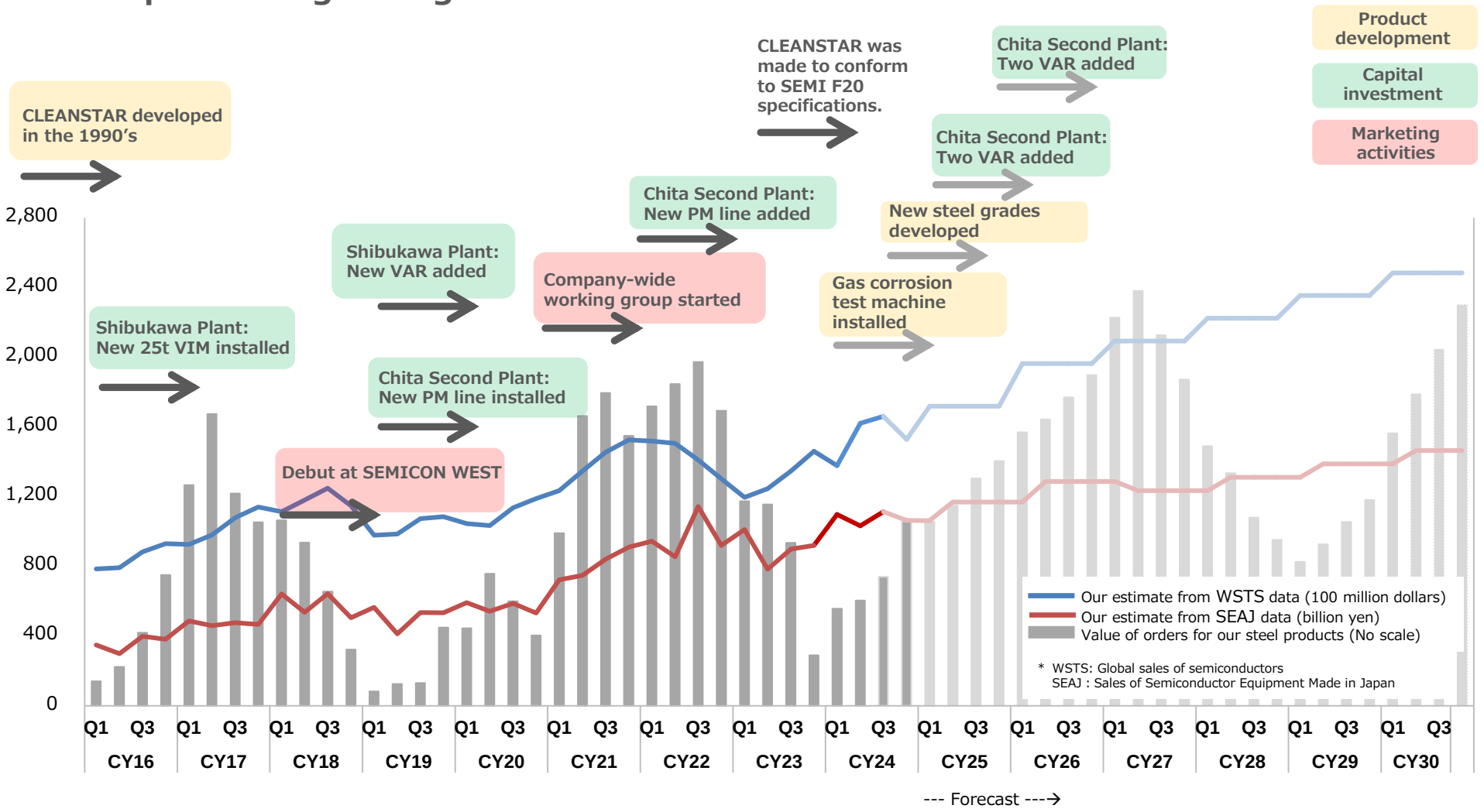
[Corrosion resistance]



Test method: JIS G0578

7. Our Measures to Promote Semiconductor Business Growth

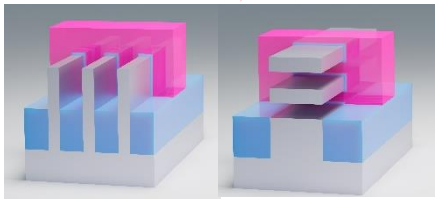
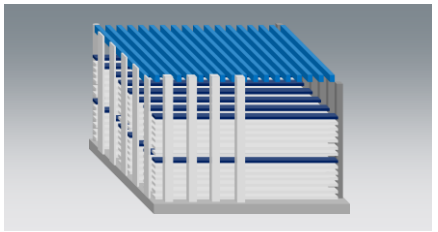
Promote product development, capital investment, and marketing activities in anticipation of growing future demand



* WSTS: World Semiconductor Trade Statistics
* SEAJ : Semiconductor Equipment Association of Japan

8-1. Technology Trends and Need for Corrosion-Resistant Materials

Product development

	Background/Requirements	Technology trends	Need for materials
Logic (processing, operation)	Refinement ・Cost reduction ・Lower power consumption ・Faster speeds	Changes in design and type of metal used in wiring	FinFET → GAA 
NAND (data recording)	High integration ・Increase data capacity ・Cost reduction	High aspect ratio etching	3D NAND 

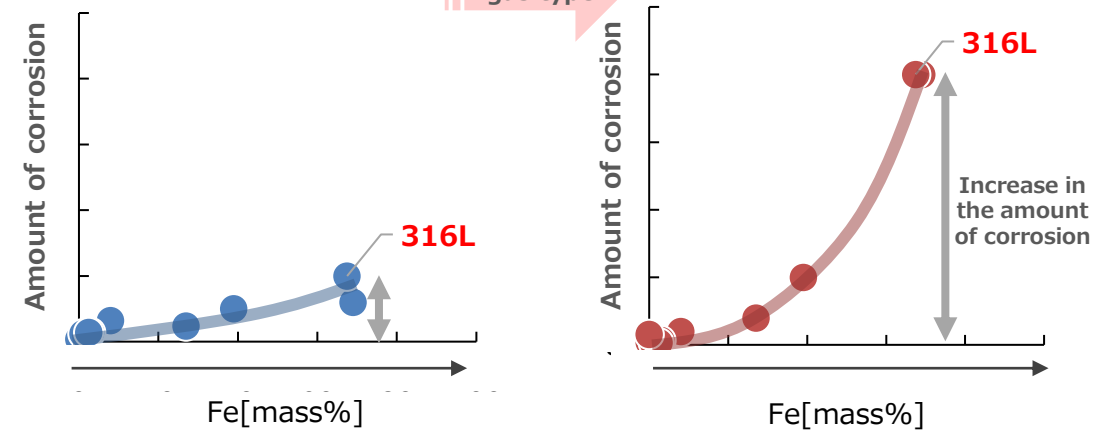
Harsher operating environments

・Change to highly corrosive gas types
・Changes in process temperatures

Increased need for highly corrosion-resistant steel

◇Results of corrosion-resistance evaluation by gas type and material (our own test)

HBr (hydrogen bromide) gas → Change in gas type → HF (hydrogen fluoride) gas



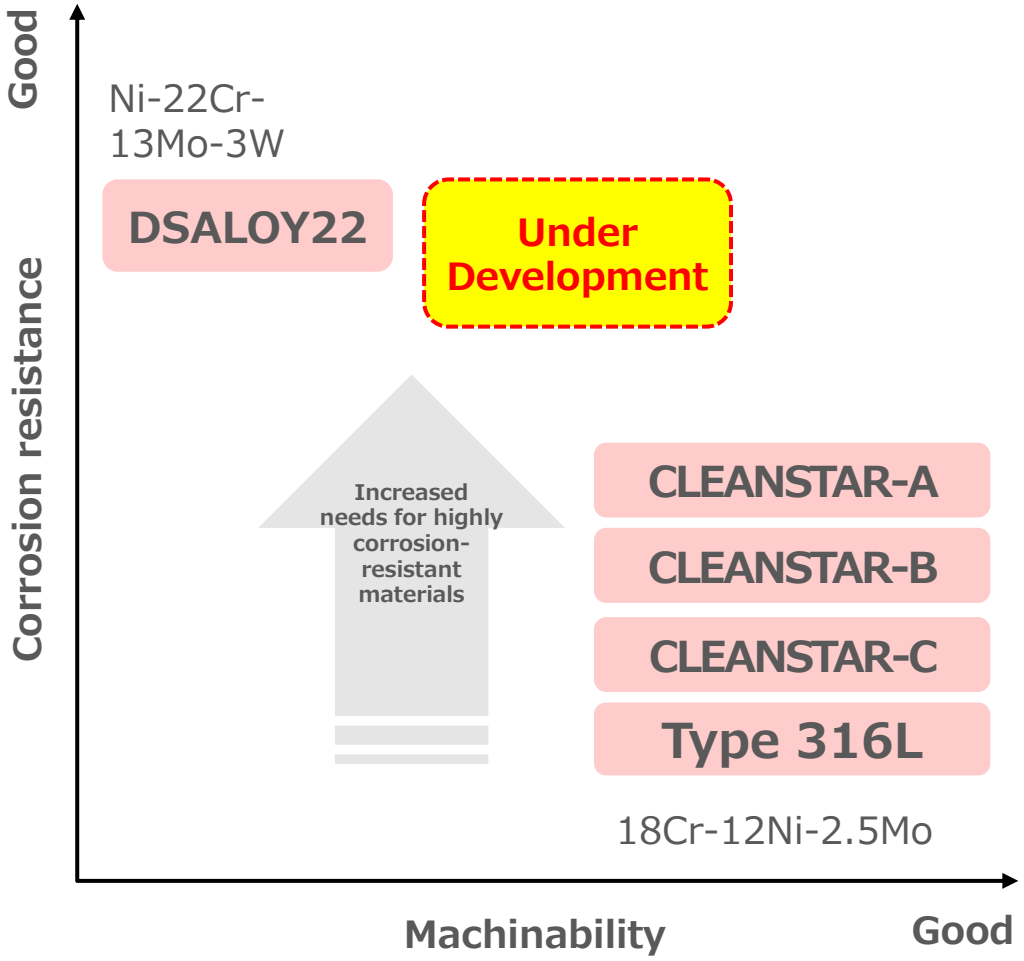
With the frequent use of highly corrosive gases, demand for higher corrosion resistance material would increase to replace Type 316L.

⇒Installed the gas corrosion testing machine
⇒Consider developing a new material with high corrosion resistance & low cost

* FinFET: Fin Field-Effect Transistor, GAA: Gate-All-Around Transistor
3D NAND: 3D NAND flash memory

8-2. Our Development & Evaluation Technology

Development of new steel grades for corrosive gas environments



Where corrosion resistance is needed

Product group	Present situation
DSALOY22 (equivalent to Hastelloy® C22®)	・For applications that require even higher corrosion resistance than CLEANSTAR provides, with highly corrosive gases and high temp environments. ・Currently developing a new material to meet the demand for highly corrosion-resistant materials with improved machinability
CLEANSTAR Type 316L	・CLEANSTAR-A, -B, and -C, according to the type of gas involved and the environment in which it is used.

＊Hastelloy and C22 are registered trademarks of Haynes International Inc.

Where improved machinability is needed

Process	Explanation
PM	・To peel steel bar's surface to adjust its dimensions and smooth its surface.
Drawing	・To stretch steel coil at room temperature to adjust diameter dimensions
Machining	・To grind off material outside the boundaries of the shape to create the shapes of parts

<Reference> Typical manufacturing processes for making parts

Process: Rolling - Heat treatment - **PM & Drawing - Grinding** - Finished part

Responsibility: Daido Steel — User

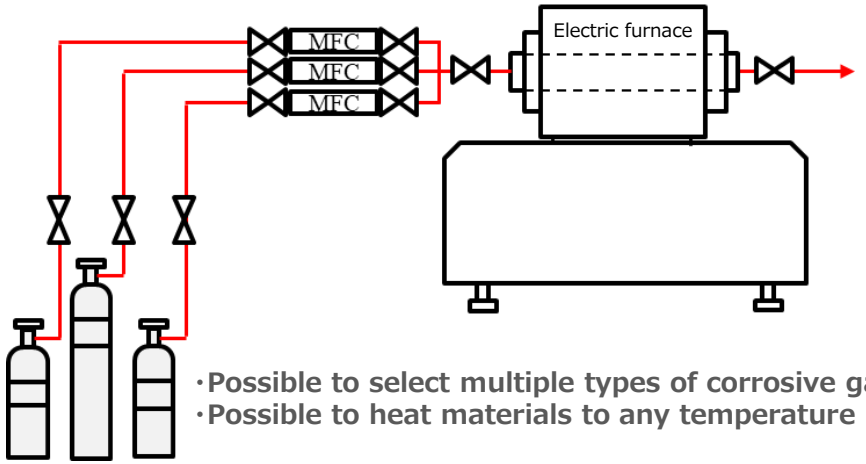
8-2. Our Development & Evaluation Technology

High-temperature gas corrosion testing equipment is currently being evaluated.

This equipment is used to replicate the operating environment in which steel materials are used during etching and thin film deposition. It makes it possible to evaluate corrosion resistance in situations that closely resemble those of actual manufacturing practice.

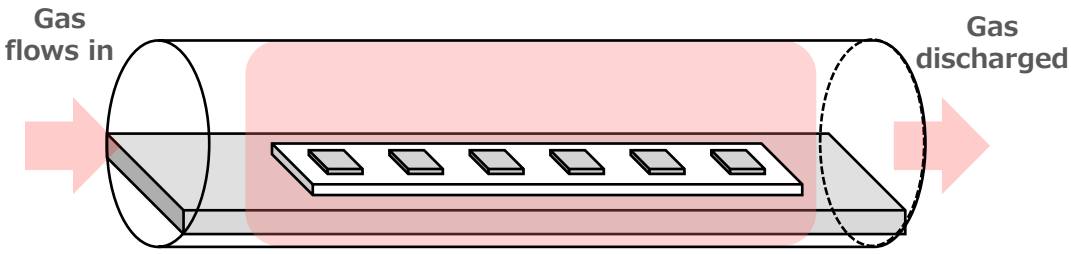
Equipment overview

High-temperature gas corrosion test laboratory

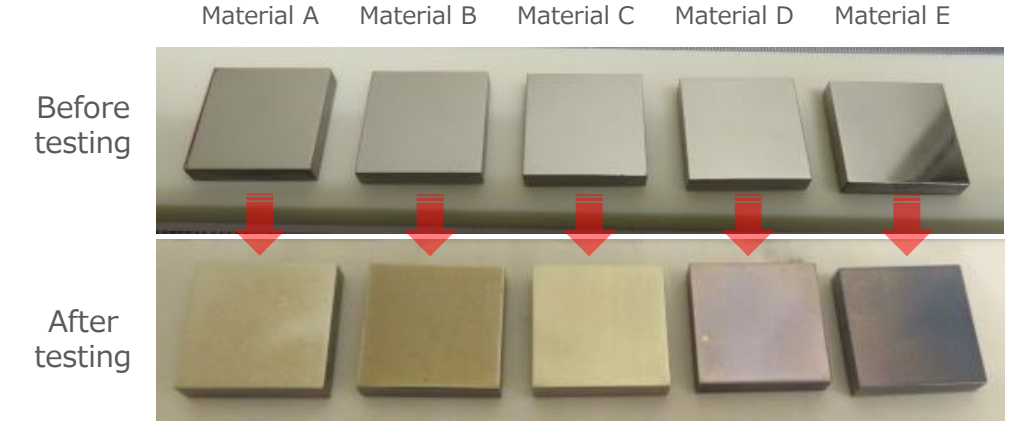


- Possible to select multiple types of corrosive gas
- Possible to heat materials to any temperature

Inside electric furnace

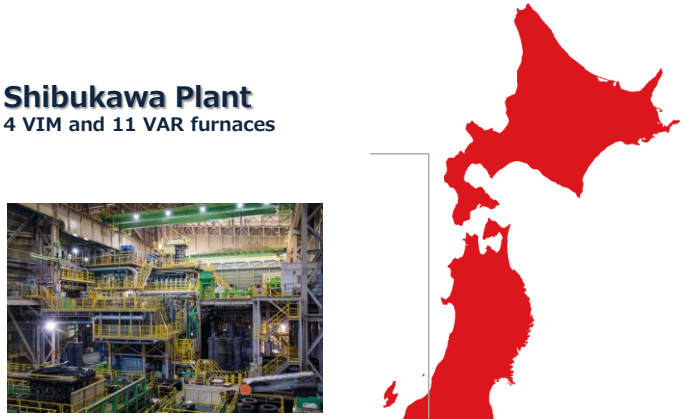


<Reference> Differences in corrosion resistance by material (test specimen appearance) Corrosive gas: HF



9. Our Capital Investments for Expanding Manufacturing Capacity

Capital investments



Shibukawa Plant
4 VIM and 11 VAR furnaces

Hoshizaki Plant
Rolling plant for stainless steel, superalloy steel and difficult-to-process bar and wire products

Port of Nagoya area map

Chita Plant
4 EAFs

Chita Second Plant
During FY2025
4 VAR furnaces being installed
(2 VAR furnaces for titanium are under construction)

Chita Second Plant ("Smart" factory)

Reallocation of production resources

Stainless steel production equipment for SPE application being installed at the Chita Second Plant
Secondary melting and subsequent processes integrated in the Nagoya area

Capacity expansion for high-performance materials

stainless steel for semiconductor production equipment and superalloy steel

A total of four VARs will be installed at the Chita Second Plant, adjacent to the Chita Plant.
The 1st VAR furnace started in December 2024 and the 2nd will start in March 2025.
The remaining two furnaces are scheduled to start operating by the end of FY2025.

Chita Second Plant and Chita Plant

VAR (started operating in Dec. 2024.)

High-temperature gas corrosion test laboratory (under test operation)

Heat treatment and machining equipment (fully operating)

* SPE: semiconductor production equipment

10. Overseas Marketing Activities

Main activities for overseas markets

1. Our exhibition at SEMICON WEST (from 2018 to 2024)

- Exhibition booth at SEMICON WEST in North America

SEMICON WEST exhibition:

2018: 1st Exhibition
2019: 2nd Exhibition
2020: Virtual exhibition due to COVID-19
2021: HYBRID exhibition (virtual)
2022: HYBRID exhibition (on-site)
2023: 6th Exhibition
2024: 7th Exhibition

2. PR activities by Daido Steel's overseas group networks

North America: Activities to meet the needs of the North American market, such as exhibiting products at SEMICON and bringing CLEANSTAR products into compliance with SEMI standards
Aggressive development of new customers through Daido Steel (America) Inc.

China: PR promotion to the world's largest semiconductor market, by utilizing sales networks such as Daido Steel (Shanghai) Co., Ltd.

Europe: Daido Steel Group Europe (Germany) conducted a survey of the European semiconductor market

11. Daido Steel's Strength for Semiconductor Production Equipment

Sufficient upward elasticity of produciton capacity

Top manufacturing capacity in Japan
Comparable to U.S. competitors
Timely capital investments executed in anticipation of increased future demand

Ability to develop new materials and processes

Our expertise in manufacturing aircraft materials and ultra-fine wire materials puts us ahead.
In addition to CLEANSTAR-A, -B, and -C, currently developing new grade that brings together the desirable characteristics of corrosion resistance and machinability.

Sources of our domestic and international marketing power

Our products secure overwhelming market share through co-creation relationships with major manufacturers of SPE parts.
In addition, we keep on developing new customers through our overseas group marketing activities.

Drastic reallocation of production resources

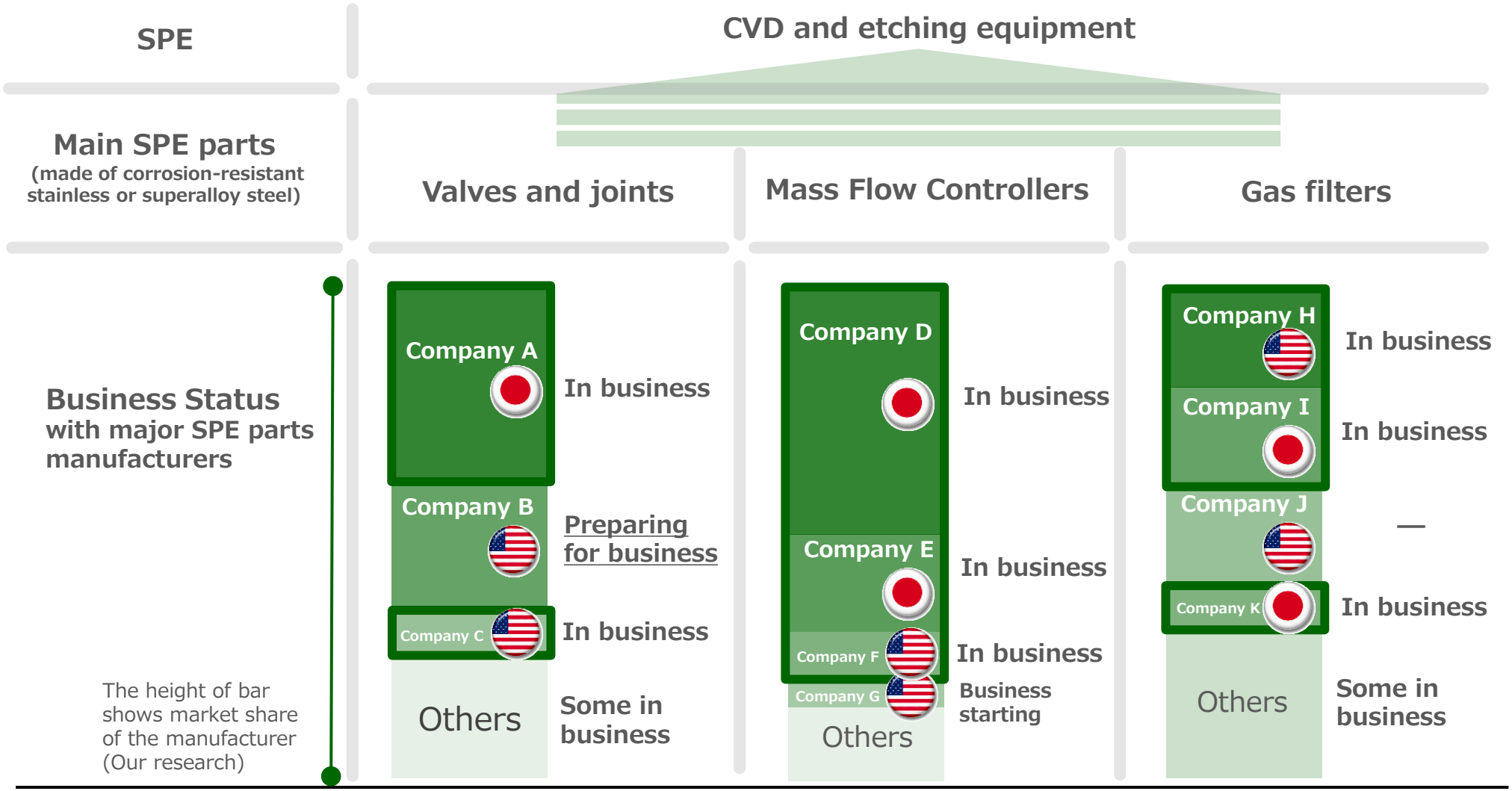
Currently promoting reallocation of production resources by utilizing Chita Second Plant.
We manage inventories according to increasing demand.

* SPE: semiconductor production equipment

12. Our Business Status with Major SPE Parts Manufacturers

Global market shares of our high-performance stainless steel bars and wire rods

Current: 40% ➡ FY2026: 50%



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