Business Strategy of the Functional Components Company

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Hitachi Metals, Ltd.

Hiroshi Watanabe
Executive Officer
President of the Functional Components Company
Business Strategy of the Functional Components Company

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2. Heat-Resistant Cast Steel (HERCUNITE™) Business

3. Aluminum Business

4. Integration of Cast Iron and Aluminum to Become No.1 Supplier

5. Piping Components Business

6. Summary
1. Business Overview
1-1. Business Composition

Addressing Society’s Needs with Functional Components

FY2018

Revenues ¥345.0 bn

Cast Iron Business

Piping Components Business

Heat-Resistant Cast Steel Business

Aluminum Business

Passenger cars

Pickup trucks

Commercial vehicles

Construction and agricultural machinery

Industrial equipment and others

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1. Business Overview
1-1. Business Composition

Addressing Society’s Needs with Functional Components

- Cast Iron Business
- Piping Components Business
- Heat-Resistant Cast Steel Business
- Aluminum Business

FY2018 Revenues ¥345.0 bn

Unprofitable businesses

- Passenger cars
- Pickup trucks
- Commercial vehicles
- Construction and agricultural machinery
- Industrial equipment and others
1-2. FY2018 Medium-Term Management Plan: Basic Policy and Goals

**Basic Policy of the Functional Components Company**

Accept the challenge of creating new value by improving the foundation of *monozukuri* to achieve global growth

**FY2018 Medium-Term Management Plan: Goals**

<table>
<thead>
<tr>
<th></th>
<th>FY2016 Actual (¥108 = US$1)</th>
<th>FY2017 Actual (¥111 = US$1)</th>
<th>FY2018 Forecast (¥105 = US$1)</th>
<th>Change vs. FY2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>¥333.5 bn</td>
<td>¥360.1 bn</td>
<td>¥345.0 bn</td>
<td>- ¥15.1 bn</td>
</tr>
<tr>
<td>Adjusted operating income</td>
<td>¥17.5 bn</td>
<td>¥11.8 bn</td>
<td>¥17.0 bn</td>
<td>+ ¥5.2 bn</td>
</tr>
<tr>
<td>Adjusted operating margin</td>
<td>5.2%</td>
<td>3.3%</td>
<td>4.9%</td>
<td>+1.6%</td>
</tr>
<tr>
<td>Overseas sales ratio</td>
<td>79%</td>
<td>80%</td>
<td>79%</td>
<td>-1%</td>
</tr>
</tbody>
</table>

**Overriding theme of FY2018: Turn around unprofitable businesses**
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2. Heat-Resistant Cast Steel (HERCUNITE™) Business

2-1. Issues and Countermeasures

**Issues**
- Greater manufacturing difficulty
- Order intake beyond capacity
- Inappropriate pricing

**Countermeasures**
- Productivity “+15%” vs. FY2016
  - Optimization of casting conditions
  - Quality improvement
  - Processing efficiency improvement
- Full utilization of invested equipment
  - Casting line (Launched Oct. 2016)
  - New concept machine processing line (Launched Mar. 2017)
  - Machine processing line in the Americas (Launched Jul. 2017)
- Price correction

Became profitable at end of FY2017; achieve profitable structure in FY2018
Continued expansion trend of downsized turbo gasoline engine market

Heat-resistant cast steel market forecast

- China
- Japan, South Korea, etc.
- Americas
- Europe

Hitachi Metals’ estimate based on various research materials
2-3. Roadmap

Transform into a business that can secure profits while addressing increasing demand

Strengths
- Components technology
  ● Proposal of optimal components
- Manufacturing technology
  ● Lighter weight and thinner design by CAE
  ● Processing technology for hard-to-cut materials
- Production capacity
  ● One of world’s largest mass production, integrated manufacturing lines

Issues
- Productivity (Cost)
  ● Promote technology development toward productivity improvement

Roadmap

<table>
<thead>
<tr>
<th>FY2018</th>
<th>FY2019–2023</th>
<th>FY2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profitable structure</td>
<td>High earnings</td>
<td>Stable accumulation of earnings</td>
</tr>
<tr>
<td>High-productivity</td>
<td>Consider investment</td>
<td></td>
</tr>
<tr>
<td>manufacturing</td>
<td>in production increase</td>
<td></td>
</tr>
<tr>
<td>technology development</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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3. Aluminum Business
3-1. Issues and Countermeasures for Aluminum Wheels

<table>
<thead>
<tr>
<th>Issues</th>
<th>Countermeasures</th>
</tr>
</thead>
</table>
| Excessive reduction of fixed costs | • Productivity improvement  
  • Improve processing (cutting) efficiency  
  • Improve coating equipment utilization rate  
  • Improve processing loss by changing layout |
| Greater mfg. difficulty (Large-diameter, sophisticated design) | • Renewal of management structure  
  • President of Waupaca concurrently serves as head of U.S. base  
  • Strengthen human resources |
| Drop in productivity due to equipment and human factors | • Recovery in order intake  
  • Improve productivity  
  • Differentiate by accommodating large diameters and sophisticated design |
| +Blackout (external factor) | Metallic | Brilliant | Special coating |
| +Drop in order intake | waupaca | AAP ST. MARYS CORP. |
| Recorded operating loss |

Promote business stabilization in FY2018
## 3-2. Market Needs and Strengths

### Main Products

<table>
<thead>
<tr>
<th>Aluminum wheels</th>
<th>Sophisticated design and large-diameter products</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-performance aluminum components</td>
<td>EV-related components, powertrain components</td>
</tr>
</tbody>
</table>

### Market Needs

- Lightweight, thin
- Low-price
- Complex form
- High heat transfer rate

### Strengths

- **Surge in potential of high-performance aluminum components due to spread of EV**
  - **High-precision CAE**: Lightweight, reduced design time
  - **Manufacturing locations in Japan and U.S.**: Structure to expand sales to the Asian region, Americas and Europe
  - **Diverse casting methods**: Gravity—low-pressure—high-vacuum die-cast (HIVAC-V®)
3-3. Action Plan

High-Performance Aluminum Components

Increase EV components by utilizing the characteristics of aluminum materials

- Develop design, material quality, junction, processing technologies
  <Improving business value in cooperation with GRIT>
- Build integrated line, strengthen cost competitiveness
- Synergies with other Companies

Expand business size by 2.5x by FY2025 (vs. FY2017)
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### 4. Integration of Cast Iron and Aluminum to Become No.1 Supplier

#### 4-1. Market Trend and Strategy

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Required needs</th>
<th>Response</th>
<th>Our product</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Passenger cars</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Combustion system</strong></td>
<td>High mileage Low cost</td>
<td>Conformity to heat-resistance requirements</td>
<td>Heat-resistant cast steel</td>
</tr>
<tr>
<td></td>
<td>Small gasoline turbo</td>
<td>Design, casting, processing Response ability of locations</td>
<td>Heat-resistant cast iron</td>
</tr>
<tr>
<td><strong>EV</strong></td>
<td>Diversified specifications</td>
<td><strong>Form, size, material</strong></td>
<td>Battery case</td>
</tr>
<tr>
<td></td>
<td>Multi-functional</td>
<td><strong>Combine light-weight and heat dissipation</strong></td>
<td>Motor/inverter case</td>
</tr>
<tr>
<td><strong>Chassis</strong></td>
<td>Low cost</td>
<td><strong>Optimization of materials x strength design</strong></td>
<td>Aluminum-based composite material</td>
</tr>
<tr>
<td>(Structural components)</td>
<td>Lightweight</td>
<td><strong>Response ability of locations</strong></td>
<td>Aluminum wheels</td>
</tr>
<tr>
<td>(Suspension components)</td>
<td>Quantitative response ability</td>
<td><strong>Japan, U.S., S. Korea, India</strong></td>
<td>Suspension components</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>CFRP/Composite material</strong></td>
</tr>
<tr>
<td><strong>Non-passenger cars</strong></td>
<td>Load bearing Low cost Accommodate large size</td>
<td><strong>Stable supply</strong></td>
<td>Waupaca</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Large casting</strong></td>
<td><strong>Horizontal casting technology</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Ductile, gray</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Large ductile</strong></td>
</tr>
</tbody>
</table>

*1 LPD: Low-pressure die-cast; 2 HPD: High-pressure die-cast; 3 CFRP: Carbon fiber reinforced plastic*
4-2. Organization Reinforcement to Address Changes

Propose optimal solutions to diversifying market needs
Address changes in the market with an optimal portfolio

Automotive Components NM Business Unit
Automotive Components Hercunite Business Unit
Automotive Components Aluminum Business Unit

Integrate

Automotive Components Business Unit
(Newly established on Apr 1, 2018)
Provides the optimal solution

Strengths of the Functional Components Company

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales ability</td>
<td>Cooperate with Corporate and other Companies</td>
</tr>
<tr>
<td>Planning and proposal skills</td>
<td>Iron, stainless steel, aluminum, resin, composite materials</td>
</tr>
<tr>
<td>Diverse product line-up</td>
<td>Materials development, structural design, casting technology, machine processing, coating, product evaluation</td>
</tr>
<tr>
<td>Technical capabilities</td>
<td>Add value by taking advantage of world’s largest manufacturing scale and manufacturing efficiency</td>
</tr>
<tr>
<td>Manufacturing efficiency</td>
<td>Global Research &amp; Innovative Technology Center (GRIT) Casting Technology Research Laboratory</td>
</tr>
<tr>
<td>Development capabilities</td>
<td></td>
</tr>
</tbody>
</table>
## 4-3. Example: Solutions for Suspension Components

### North American market trend of suspension components (knuckles)

- **Steel forging**
- **Aluminum forging**
- **Aluminum cast**
- **Ductile cast iron**

(Hitachi Metals’ estimate based on various research materials)

### Propose cast iron, aluminum, and new materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Under mass production</th>
<th>Under mass production</th>
<th>Considering mass production</th>
<th>Considering development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>100</td>
<td>70</td>
<td>50</td>
<td>50 or less</td>
</tr>
</tbody>
</table>

- **Mileage regulations → lightweight → aluminum replacement progressed**

- Continue cast iron through development cost reduction and stable procurement measures
4-4. Waupaca’s Portfolio Reform

**Cash cow area**
- Growth in population → Growth in grain production
- Global demand increase
- Increase in demand for complex form products

**Business expansion area**
(address need for high added value)

**Future scheme**
- Heat-resistant cast steel manufacturing
- Deployment of aluminum, resin, composite materials

**Waupaca’s sales portfolio**

- **Passenger car**
  - 2017: 39% (FY), 61% (FY)
  - Expansion: 46% (FY)

- **Heavy-duty**
  - 2017: 61% (FY), 39% (FY)

**Notes**
- Although global vehicle production volume is steady, demand in U.S. is declining.
- Commercial vehicles, agricultural/construction machinery, railway, industrial equipment.
- Deployment of aluminum, resin, composite materials.
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Three pillars for the growth of the Piping Components Business

Expansion of existing businesses
Inject managerial resources into growth businesses

Strengthening of monozukuri capabilities
Capital investment in Kuwana Works (Launch in FY2018)

Commencement/strengthening of new business (solutions business)
Established Piping Components Solutions Sales Dept. (Apr 2018)

Sales target of the Piping Components Business
¥50.0 bn (FY2017) ⇒ ¥70.0 bn (FY2021)
5-2. Expansion of Existing Businesses

- **Product portfolio**

  ![](chart.png)

  *Size of the circle indicates the size of sales
  *Share is Hitachi Metals’ estimate

  - **Mass flow controllers**
  - **Flexible piping systems**
  - **Cast pipe fittings, polyethylene piping systems, valves**

- **Sales increase due to injection of managerial resources in growth businesses**

<table>
<thead>
<tr>
<th>Expansion measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mass flow controllers</strong></td>
</tr>
<tr>
<td>Development and sales expansion of next-generation products</td>
</tr>
<tr>
<td><strong>Flexible piping systems</strong></td>
</tr>
<tr>
<td>Market entry based on strength of high workability</td>
</tr>
<tr>
<td>• Europe: Market penetration by strengthening distribution network</td>
</tr>
<tr>
<td>• China: Obtain certification from major gas company</td>
</tr>
</tbody>
</table>

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5-3. Strengthening of Monozukuri Capabilities

Capital expenditure in Kuwana Works with the Aim of Further Strengthening Monozukuri Capabilities of the Piping Components Business

**Investment details**

- Rationalization toward productivity improvement of cast pipe fittings
- Enhancement of production capacity of flexible piping systems (20% capacity enhancement)

**Amount and timing**

- Approx. ¥3.0 bn
- Scheduled for launch in FY2018
5-4. Commencement/Strengthening of Solutions Business

Measures toward a ¥70.0 billion business

<table>
<thead>
<tr>
<th>Social needs</th>
<th>Labor shortage</th>
<th>Energy/resource-saving</th>
<th>Management system</th>
<th>Safety/security</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>efficiency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deterioration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>prevention</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Maintenance-free</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>monitoring</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Mass flow control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>system</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Application to</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hazardous mass flow</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

- **Stainless flexible pipes for gas**
- **Polyethylene systems for gas**
- **Chilled tower**
- **Mass flow controller**
- **Cast pipe fittings**
- **Malleable valves**

**Hitachi Metals’ technologies**

- Materials technology and proposal skills that bring out the marginal performance of materials
  - Alloy/form technology
  - Mfg. process technology
  - Analysis/evaluation technology

**Hitachi Group’s technologies**

- **Solutions**
- **Infrastructure**

[Design ability that guarantees safety and security]

[Aim for pipes that accommodate any kind of mass flow and can be used anywhere]

[Diversity of monozukuri]

[Diversity of performance evaluation technology]

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Accept the challenge of creating new value by improving the foundation of *monozukuri* to achieve global growth

**FY2018 Plan**
- Revenues: ￥345.0 bn
- Adjusted operating income: ￥17.0 bn
- Adjusted operating margin: 4.9%
Information on Risks Inherent in Future Projections

This document contains forward-looking statements—such as results forecasts and management plans—that are not historical facts. All such forward-looking statements are based upon available information and upon assumptions and projections that were deemed reasonable at the time the Company prepared this document. Changes to the underlying assumptions or circumstances could cause the actual results to differ substantially. Factors causing such differences include, but are not limited to, the following:

• Changes in economic conditions and regulations in the main markets where the Company operates, particularly Japan, the United States, Asia and Europe
• Sudden changes in technological trends
• Changes in the competitive advantage and the capabilities of the Company and its subsidiaries and affiliates to develop and commercialize new products and businesses
• Fluctuations in the status of product markets, exchange rates and international commodity markets
• Changes in the financing environment
• The capability of the Company and its subsidiaries and affiliates to cope with fluctuations in product supply and demand, the status of product markets, exchange rates and international commodity markets
• Protection of the Company’s intellectual property, and securing of licenses to use the intellectual property of other parties
• Changes in the status of alliances with other parties for product development, etc.
• Fluctuations in Japanese stock markets