Past Medium-Term Management Plans

	Medium-Term Management Plan (FY2012-FY2014)	Medium-Term Management Plan (FY2015-FY2017)	Medium-Term Management Plan (FY2018-FY2020)
Management Policy	● Position quality and safety as the foundation of business operations ● Reflect needs of the market (customers) in product development and expand sale of new products ● Become a group that faces the needs of the market (customers) head-on and responds accordingly ● Bolster business of all major products	● Aim for a business foundation supported by the three product groups ● Reinforce the competitiveness and business foundation of the three main product groups ● Develop the Asian market and create a business foundation	● Significantly raise global production capacity ● Raise capabilities of group companies to strengthen all-around abilities ● Increase customer satisfaction by raising QCDS capabilities ● Strengthen management foundation to support future growth ● Lay groundwork for growth in the future
Business Strategy	● Continuously upgrade technologies and skills (strengthen core technologies) ● Enhance product appeal with technologies and skills (expand product variation) ● Raise competitiveness of actuators ● Implement sales expansion strategy in the Asian market	● Find new applications for HarmonicDrive® Speed Reducers and launch new products in the market ● Actively launch new mechatronics products ● Capture overseas markets for precision planetary speed reducers ● Actively expand sales in the Asian market ● Improve organizational strength and develop human resources	● Raise production capacity and achieve improvements in productivity ● Carry out greater investment in the main production bases and bolster comprehensive capabilities ● Normalize and reduce production lead times, launch new products, and strengthen the support system for technology proposal capability ● Secure and develop human resources, utilize IT, promote management that takes ESG into account
Achievements and Challenges	Net sales for industrial robots showed significant growth, and net sales for Asia rapidly increased roughly three-fold over the threeyear period. Results fell slightly short of numerical targets, but net sales, operating income, and operating income to net sales ratio all reached all-time highs, with operating income to net sales ratio achieving 27.2%. Also, ROE stood at 14.7%.	Net sales and operating income have cleared numerical targets by a wide margin and set new records. A rapid growth in demand globally for industrial robots and the conversion of a German affiliate company into a subsidiary were contributing factors. However, the operating income to net sales ratio figure ended short of the plan. This was mainly attributable to the fact that against a three-year plan for aggregate capital investment of ¥10 billion, the actual figure reached ¥17.6 billion, and the burden of depreciation and amortization expanded from the planned ¥6 billion to ¥9.1 billion. Issues remained with regard to production capacity and stable supply.	In steadily implementing the business strategy, cutbacks in capital investment worldwide for manufacturing industry due to factors such as US-China trade friction, in addition to declining advance orders as a result, and further, a sharp decline in capital investment with the global spread of COVID-19 became evident, resulting in considerably underperforming against numerical targets. While keeping the capital investment plan under restraint, the groundwork for growth looking toward 2030- 2050 was being firmly laid.

● **Medium-Term Management Plan**

	FY2014 Management targets	FY2014 Results	FY2017 Management targets	FY2017 Results	FY2020 Management targets	FY2020 Results
Net sales	¥26.0 billion	**¥25.9 billion**	¥35.0 billion	**¥54.3 billion**	¥100.0 billion	**¥37.0 billion**
Operating income	¥7.5 billion	**¥7.0 billion**	¥9.5 billion	**¥12.5 billion**	¥26.0 billion	**¥0.8 billion**
Operating income to net sales ratio	28.8%	**27.2%**	27.1%	**23.2%**	26.0%	**2.3%**
Dividend payout ratio and dividends per share	–	**27.2% (¥29/share)**	–	**31.5% (¥26/share)**	–	**290.6% (¥20/share)**
Capital investment (3-year total)	–	**¥5.1 billion**	¥10.0 billion	**¥17.6 billion**	¥71.0 billion	**¥33.7 billion**
Depreciation and amortization (3-year total)	–	**¥3.5 billion**	¥6.0 billion	**¥9.1 billion**	¥25.5 billion	**¥21.6 billion**
R&D expenditure (3-year total)	–	**¥3.6 billion**	¥4.8 billion	**¥4.9 billion**	¥9.4 billion	**¥7.1 billion**

Previous Medium-Term Management Plan (FY2021-FY2023)

Management Policy

Long-term Vision

In pursuit of total motion control

- Take on the challenge of developing new technologies and skills that capture changes in the environment
- Achieve QCDS that goes beyond customer expectations
- Contribute to creating a sustainable society through corporate activities

Basic Policy

Toward the Next 50 Years: Moving to a Solid Growth Stage

(1) Achieve QCDS that meets customer expectations
(2) Expand RD, AD, and MT businesses by developing valuable products and enhancing services
(3) Build a management foundation that meets the demands of the times
(4) Strengthen coordination and maximize synergies with overseas group companies and institutions
(5) Create new standards that define the next 50 years through outside-the-box thinking

Initiatives implemented and their results

investment in property

- Increased facility's capacity at the Ariake Factory
  (40,000 units for industrial machines and 30,000 units for automobiles)
  ➡ Productivity per worker is now more than twice that of the conventional line
- Promoted DX in the factory

investment in human resources

- Improved operations with "waste elimination" as the keyword
- Promoted multi-skilling of workers
- Further improved workers' skills

Increase our capabilities to respond to our customers' issues

- Discover new needs
- Absorb insights of different industries, advisers, and outside research institutions
- Develop new products applying the latest light-weighting technologies and methods
- Develop HarmonicDrive® with built-in torque sensor
- Adopt local content
- Maintain and improve "universal quality"

Operating results

We set numerical targets such as net sales of ¥70.0 billion, operating profit of ¥15.0 billion (operating profit to net sales ratio of 20% or more), ROE of 10% or more, equity ratio of 70% or more, and dividend payout ratio of 30% or more for FY2023, the final fiscal year.

Regarding financial results for FY2022, net sales reached ¥71.5 billion, exceeding the numerical target, driven by the emergence of post-COVID-19 pent-up demand. However, operating profit was ¥10.2 billion, operating profit to net sales ratio was 14.3%, and ROE was 7.5%, against the backdrop of more aggressive capital and R&D investments than our plan, as well as securing human resources and strengthening investment in human resources.

Regarding financial results for FY2023, net sales were ¥55.7 billion and operating profit was ¥0.1 billion (operating profit to net sales ratio was 0.2%), against the backdrop of deteriorating external environment such as the slowdown of the Chinese economy, sluggish capital investment in semiconductors, and prolonged inventory adjustment at industrial robots manufacturers. In addition, we recorded impairment loss on intangible assets (goodwill, customer related assets, and technical assets) of Harmonic Drive SE, our consolidated subsidiary, resulting in ROE of -27.1%.

Equity ratio as of the end of FY2023 was 66.6%, slightly below the numerical target but stable at a high level. As for shareholder returns, we paid dividends that exceeded our commitment to a dividend payout ratio.

Expected investment results in fiscal 2024 and beyond

- Improvement in abilities to meet delivery deadlines
- Productivity improvement
  (Productivity per worker to be more than three times that of the conventional production line at the Ariake Factory)
- Sustainable supply chain system and quality maintenance during production expansion
- Enhancing the sales contribution of new products and new applications
- Increase cost competitiveness

● Previous Medium-Term Management Plan

	FY2021 Results	FY2022 Results	**FY2023 Results**	FY2023 (Final Year of the Medium-Term Management Plan) Management Targets	
Net sales	¥57.0 billion	¥71.5 billion	**¥55.7 billion**	¥70.0 billion, 24% CAGR	Tie market expansion to our group's growth
Operating profit	¥8.7 billion	¥10.2 billion	**¥0.1 billion**	¥15.0 billion	Improve profitability by providing high value products
Operating profit to net sales ratio	15.3%	14.3%	**0.2%**	20+%	Improve profitability by providing high value products
ROE	6.6%	7.5%	**−27.1%**	10+%	ROE > Cost of equity
Equity ratio	69.0%	67.4%	**66.6%**	70+%	Build a financial base that balances growth and stability
Dividend payout ratio	30.4% (¥21/share)	35.1% (¥28/share)	**−% (¥20/share)**	30+%	Maintain stable dividends
Capital investment	¥5.6 billion	¥9.2 billion	**¥4.9 billion**	¥15.0 billion (3-year total)	Lay out capital investments to support our group's growth
R&D expenditure	¥3.0 billion	¥3.2 billion	**¥3.6 billion**	¥9.0 billion (3-year total)	Create new technologies and skills

Overview of the Medium-Term Management Plan for Fiscal 2024–2026

Basic policy

Take on the challenge of "value creation and transformation"

The basic policy of the Medium-Term Management Plan, which concludes in FY2026, is "Unleash the Brain Power of Individuals and Take on the Challenge of Value Creation and Transformation." All employees at the HDS Group will embrace two challenges: "value creation" to create new value and respond to technological innovations and new applications, and "transformation" to change conventional structures, common sense, and culture for the future. To realize this vision, we will work on three issues aligned with our materiality, priority issues to be addressed, and strive to achieve both the management targets of the Medium-Term Management Plan and our aspirations for FY2030.

- **What do we aim to achieve?**
  Sustainable growth of all businesses with an emphasis on profitability
- **What is necessary to achieve this?**
  Strengthen management resources (people, things, money, information) that can adapt to changes in the environment
- **Sustainability**
  Initiatives to enhance corporate value that will continue into the future

Solving issues to be addressed under the Medium-Term Management Plan to achieve the long-term vision for 2030

Issues to be addressed in the Medium-Term Management Plan

1. **Sustainable growth of all businesses with an emphasis on profitability**
   - Development of new drivers for growth
   - Thorough implementation of QCDS+Speed to meet customer expectations
2. **Strengthen management resources that can adapt to changes in the environment**
   - Realize an organization where individual growth and diverse skills ("brain power") are demonstrated and respected
   - Growth investment aware of capital efficiency
   - Strengthen financial foundation and governance
3. **Initiatives to enhance corporate value that will continue into the future**
   - Full-scale development of activities based on the Basic Policy of Sustainability

Materiality (material issues)

1. Maximize the value of human capital
2. Achieve QCDS that goes meets customer expectations
3. Take on the challenge of developing new technologies and skills that coordinate with changes in the environment
4. Contribute to creating a sustainable society through corporate activities
5. Establish a management foundation in harmony with the times

Management targets

Items		FY2024 Results	FY2025 Forecast	FY2026 Management targets		Aspirations (FY2030)
Growth	Net sales	¥55.6 billion	¥57.0 billion	¥90.0 billion	Tie market expansion to the HDS Group's growth	**¥100.0+billion**
Profitability	Operating profit to net sales ratio	0.0%	2.6%	15–20%	Provide high value-added products and drive cost transformation	**20+%**
	EBITDA margin	14.4%	15.4%	25–30%		**30+%**
Efficiency	ROE	4.4%	–	10+%	> Cost of equity	**10+%**
	ROIC	0.0%	–	10+%		**10+%**
Stability	Equity ratio	69.5%	–	70+%	Build a financial base that balances growth and stability	**70+%**
Shareholder returns	Dividend payout ratio	54.7%	145.7%	30+%	Dividend increase due to financial results expansion	**30+%**
Capital investment	Capital investment	¥3.7 billion	¥6.8 billion	¥27.5 billion (3-year total)	Lay out capital investments to support the HDS Group's growth	–
Development technologies	R&D expenditure	¥3.7 billion	¥4.0 billion	¥12.3 billion (3-year total)	Create new technologies and skills	–

Progress of the Medium-Term Management Plan for Fiscal 2024–2026 (FY2024)

Priority measures to realize sustainable growth with an emphasis on profitability

Net Sales: consolidated net sales for FY2024 were ¥55.6 billion, falling short of the initial forecast of ¥58.5 billion and decreasing 0.3% year on year. Despite a strong recovery in orders during the second half of the fiscal year, performance was affected by restrained capital investment and revisions in the automotive industry, as well as prolonged inventory adjustments among semiconductor manufacturing equipment manufacturers. For FY2025, net sales are projected to increase 2.5% year on year to ¥57.0 billion.

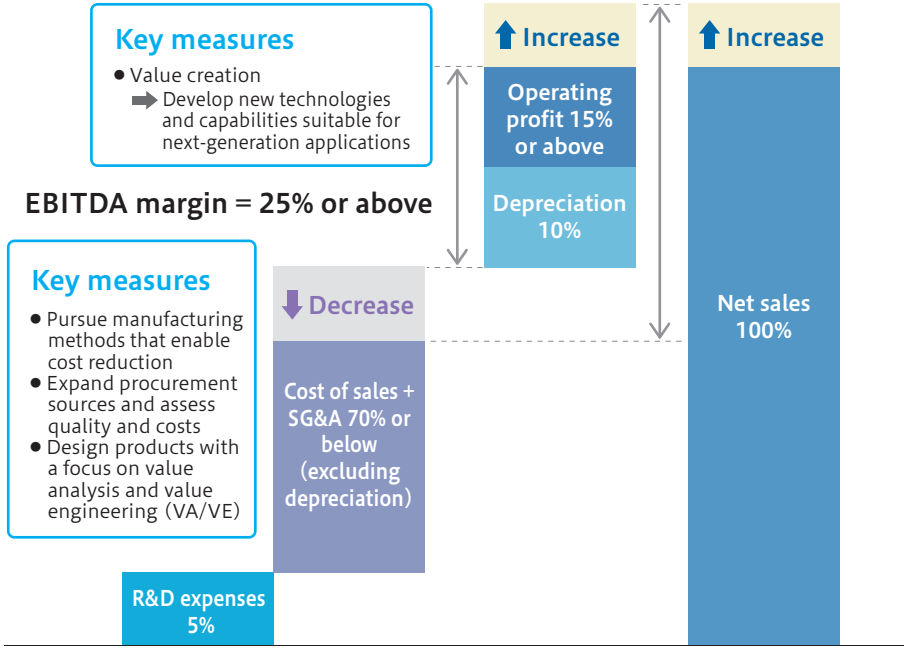
Profitability: operating profit for FY2024 returned to a modest surplus, and the EBITDA margin reached 14.4% after accounting for ¥8.0 billion in depreciation and amortization. In addition to revising sales prices, we steadily advanced key initiatives, including a company-wide cost innovation project that contributed ¥0.3 billion in profit and is expected to generate ¥1.0 billion in FY2025. However, profitability remained subdued due to a ¥1.9 billion decline in operating profit resulting from lower sales. Operating profit for FY2025 is projected to be ¥1.5 billion, representing an operating profit margin of 2.6%.

Net sales for new applications will drive growth

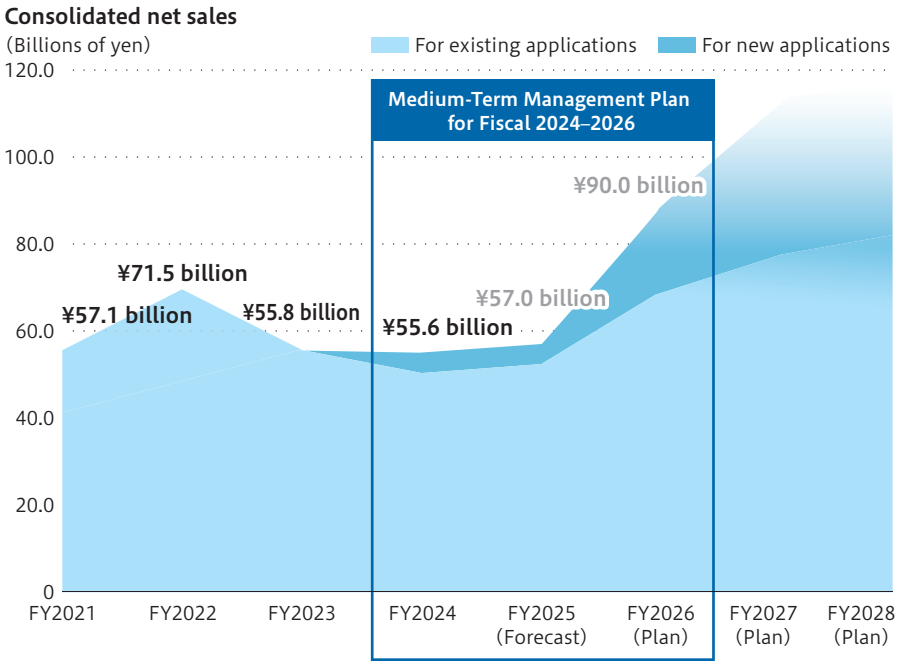
For existing applications: demand for industrial robots declined due to a shift from electric vehicles back to internal combustion engine vehicles, primarily hybrid vehicles, as well as the impact of U.S. tariffs, which prompted the automotive industry to reassess or delay capital investment. However, inventory adjustments at robot manufacturers have largely been completed, and a recovery in orders is expected as end-user demand gradually rebounds.

For new applications: in FY2024, the HDS Group's market share in China increased to 12.1%, up 2.8 percentage points year on year, driven by growing adoption among mid-tier Chinese robot manufacturers. In the emerging and globally watched field of physical AI, several companies including startups have entered the mass production phase, and the HDS Group has secured supply commitments for mass production. We have also begun collaborations with major corporations exploring entry into the physical AI sector.

● **Profitability target for FY2026 (Final Year of the Medium-Term Management Plan)**



● **Net sales target of the Medium-Term Management Plan for fiscal 2024–2026**



Message from the Chief Financial Officer

Representative Director
Senior Managing Executive Officer
Chief Financial Officer
Kazutoshi Kamijoh

We will steer our financial and capital strategies to meet the expectations of our shareholders and investors as we effectively capture medium- to long-term growth opportunities presented by physical AI systems and other areas while strengthening our risk management.

Key Points

- **The first year of the Medium-term Management Plan (fiscal 2024–2026) turned out to be challenging, as orders came in below expectations.**
- **Although cash flows provided by operating activities remained limited, the Company's financial position improved as we reduced cross-held shares and curbed cash outflows from investing activities.**
- **We remained flexible in our investment decisions, ensuring that we did not miss growth opportunities presented by physical AI systems and other emerging applications.**

The role of the Chief Financial Officer (CFO) of the HDS Group

The HDS Group's performance is greatly affected by global capital investment trends. Thus, it is relatively volatile, making it difficult to determine appropriate production capacity and decide on capital investments. Responding to short-term demand fluctuations is especially difficult, but it is my role and responsibility as CFO to choose and implement the optimal financing method, which includes sources other than cash flows from operating activities, to secure the funds needed to make capital investments at the right timing based on medium- to long-term demand forecasting.

As a listed company, we consider the market capitalization of our stock (¥299.8 billion as of the end of fiscal 2024) an important indicator of corporate value. Theoretically, the corporate value is the future cash flows discounted to their present value. However, we believe that the high evaluation of the price-to-book ratio (PBR) reflects expectations of future stock price growth, even though fiscal 2025 performance is forecasted to remain low. In this case, I also serve the important role of correctly understanding the expectations of shareholders and investors, disclosing information, and presenting our growth story accordingly.

Total shareholder return (TSR) for fiscal 2024 and dialogue and engagement with shareholders and investors

As CFO of the Company, I regret to report that we were unable to increase TSR for fiscal 2024 through higher capital gains, which shareholders and investors expect. Regarding dividends, a form of income gain, our basic policy is to pay dividends aligned with earnings performance, with a target dividend payout ratio of 30%. However, for the sake of stable dividend payments, we have paid an annual dividend of ¥20 per share even when short-term profit generation was limited. We have consistently taken comprehensive measures to enhance shareholder returns, including the decision to repurchase treasury shares totaling ¥1.2 billion, using part of the funds obtained from the sale of cross-held shares.

We incorporate feedback from shareholders and investors and demand forecasts into our business plans. Capital investment in physical AI systems warrants particular attention. Our policy here is to proceed in stages, carefully assessing the opportunities and risks of this business and adhering to the schedules requested by customers while maintaining close oversight of management risks. In fact, in fiscal 2024, we made a major revision to our investments in response to a customer's change in production plan, deciding to suspend or postpone certain planned production ramp-ups. Through dialogue with shareholders and investors, we provide careful explanations of these situations to gain their understanding.

Fiscal 2024 performance in review and progress in the Medium-term Management Plan

Looking back on our performance in fiscal 2024, we reported rather weak results: net sales of ¥55.6 billion and operating profit of ¥0.0 billion, a sharp contrast with the start-of-the-year performance forecasts of ¥58.5 billion and ¥2.7 billion,

respectively. When we revised our interim full-year performance forecast, we even anticipated the possibility of posting a consolidated operating loss. However, we managed to report a modest operating profit owing to the Group's collective effort. Notably, we successfully reversed the operating loss in the first half and returned to profitability on a monthly and quarterly basis in the second half, putting our income back on a recovery track. This has a remarkable bearing on how we view our fiscal 2025 performance outlook.

Currently, our break-even sales are approximately ¥13.5 billion on a quarterly basis. However, in the second half of fiscal 2024, we surpassed this threshold in the third and fourth quarters, achieving profitability for the period. However, the absolute amount of operating profit remains insufficient. Therefore, it is premature to conclude that our profitability has fully recovered, at least numerically, as certain challenges still need to be addressed.

If I break down our operating profit and loss in fiscal 2024 by region, our business in Japan (the parent company and subsidiaries in Japan combined) remained in the red but showed a clear improvement trend compared with the remarkable deficit recorded in fiscal 2023, following a recovery path toward returning to profitability in fiscal 2025. This upward trajectory is primarily attributable to a steady increase in orders and the resultant rise in factory utilization rates in Japan, as the issue of excess inventory among customers and us has been gradually resolved. Cost reduction measures and price revisions also contributed somewhat to the recovery. However, the situation was mixed between positives and negatives, with the latter exemplified by the rise in labor and materials costs. In China, our sales grew as more local industrial robot manufacturers seeking to develop high-performance, highly durable products chose our solutions, resulting in improved operating profitability. Conversely, we faced difficulties in Germany and the U.S., which had driven operating profit in fiscal 2023. In fiscal 2024, our German subsidiary experienced lower profitability due to reduced demand for its main applications, industrial robots and semiconductor manufacturing equipment, and also due to the stagnation of the European economy and a decrease in small projects, which tend to be more profitable. In the U.S., sales and profits declined as the demand for advanced medical and semiconductor manufacturing equipment softened.

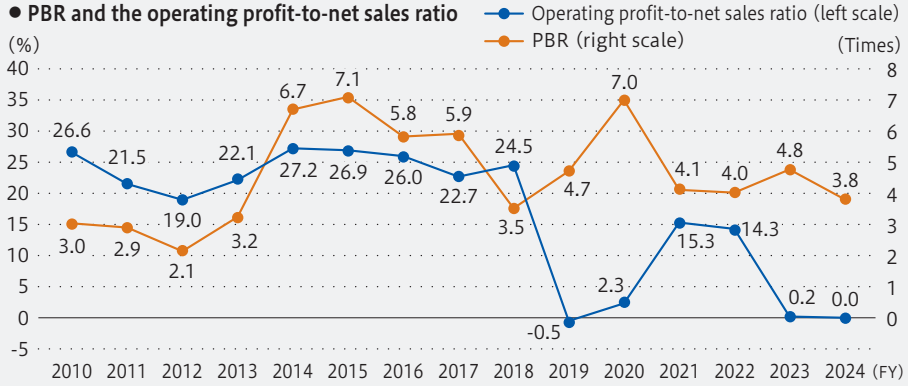
On the balance sheet, net assets decreased because of impairment losses on goodwill and other intangible assets related to the acquisition of the German subsidiary toward the end of fiscal 2023 (¥28.1 billion). However, in fiscal 2024, partly reflecting reduced debt following early repayment of long-term borrowings, equity ratio rose from 66.6% to 69.5%. Recording such a large amount of impairment losses was a difficult decision, but thanks to this and other measures, our total assets have declined by over ¥40.0 billion over the past two years, resulting in a healthier balance sheet. Furthermore, we sold a considerable amount of cross-held shares to enhance corporate governance effectiveness, thereby improving our capital efficiency. Because of this move, only a small portion of the cross-held shares now remain.

Progress in key performance indicators (KPIs) in the first year of the Medium-term Management Plan

Regarding the KPIs outlined in the Medium-term Management Plan for fiscal 2024–2026, those related to scale and profitability, such as net sales, the operating profit to net sales ratio, and EBITDA margin, fell short of the start-of-the-year plans, marking a challenging start for the first year (p. 29). For capital efficiency indicators, ROE and ROIC stood at 4.4% and 0.0%, respectively, both falling short of our capital cost of approximately 8%. Although short-term income shows signs of improvement, we believe that enhancing capital efficiency, particularly in efforts to restore earning power, remains crucial.

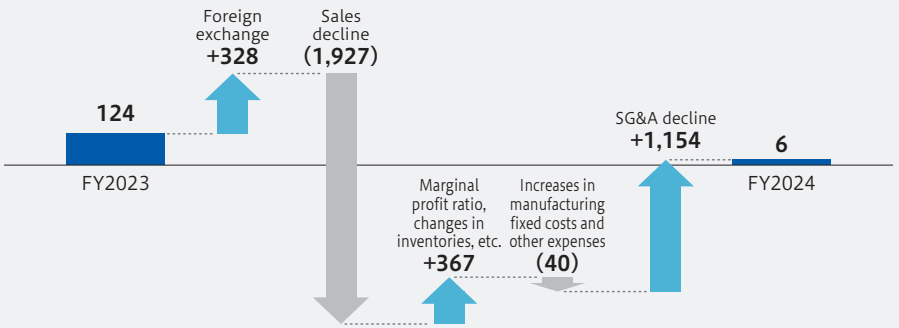
On the financial front, as I mentioned earlier, the impairment write-down of ¥28.1 billion recorded in fiscal 2023 in association with the German subsidiary helped reduce subsequent amortization of intangible assets and lower fixed expenses. Similarly, we recorded approximately ¥1.1 billion of fixed asset impairments associated with a subsidiary in Japan (Harmonic Precision Inc.) at the end of fiscal 2024. These measures align with our financial policy of enhancing the soundness and transparency of the Group's balance sheet by appropriately reflecting financial risks that may arise when earnings deteriorate in our financial statements. Turning to current assets, our inventories increased around 2023, when semiconductor procurement risk was being keenly felt, and remain at a high level. We are addressing this using inventory while reducing it in parallel. We will continue this initiative into fiscal 2025.

● **PBR and the operating profit-to-net sales ratio**



● **Factors of changes in operating profit in FY2024**

Millions of yen



Message from the Chief Financial Officer

Progress in cash allocation and enhancement of capital efficiency

In fiscal 2024, cash flows from operating activities amounted to ¥7.5 billion, ¥2.0 billion below the target of the Medium-term Management Plan. This shortfall is primarily attributable to sluggish operating profit, which undershot the Plan by ¥2.7 billion. More specifically, demand recovery in certain applications, such as industrial robots and semiconductor manufacturing equipment, was slower than that originally assumed by the Plan. Meanwhile, we recorded an inflow of ¥8.3 billion from the disposal of cross-held shares. As part of our efforts to reduce total assets and curb interest expenses, a portion of these proceeds was allocated to financial activities, including the repayment of long-term borrowings.

Prudent risk management enabled us to keep cash outflows from investing activities below the original budget.

We were able to restrain payment for capital investments for fiscal 2024 to ¥3.76 billion, compared with the originally planned ¥12.0 billion. This is because our customer rescheduled their production plan for a large physical AI-related project, shifting all stages to later dates. In response, we postponed our own production ramp-up investment plan accordingly. To increase the production of new small, flat, and lightweight models, we allocated approximately ¥10.0 billion for this investment project in fiscal 2024; however, we spent only approximately ¥1.0 billion, with the remaining funds carried over to fiscal 2026 and beyond. Meanwhile, we conducted digital transformation (DX)-related investments as planned. These included an ERP version upgrade aimed at strengthening the management foundation, and system investments to enable the real-time management of manufacturing processes. These foundational investments not only reinforce our management infrastructure but also represent key strategic initiatives designed to enhance capital efficiency over the long term.

This disciplined control of capital investment was not the result of hindsight but of our flexible and prudent approach to risk management. Working with machine tool manufacturers, one of our key partners, we keep them informed of shifting demand trends and ongoing discussions within the Company, so as to adopt flexible approaches to minimize the effects on both sides. Consequently, we were able to minimize the overall management risks, although the acquisition of certain equipment could not be avoided. We are projecting approximately ¥6.5 billion in capital investment for fiscal 2025. However, depending on the progress of individual projects, this figure may fluctuate considerably. Currently, the utilization rate of our flagship factory in Nagano Prefecture remains low at approximately 50%. As such, we plan to expand sales and improve profitability by making full use of existing facilities. For the time being, capacity expansion investments will be limited to products that cannot be handled by existing facilities, new applications, or production lines with limited spare capacity.

Overall, our capital investment over the three years of the current Medium-term Management Plan is expected to total ¥17.0–18.0 billion, which is likely to fall short of the start-of-the-year plan by approximately ¥10.0 billion. However, we may resume large-scale investment should the demand for physical AI-related or other products increase sharply, as such demand is expected to support the Group's top-line growth over the medium to long term.

Regarding shareholder returns for fiscal 2024, in addition to paying a cash dividend of ¥20 per share, we executed a portion of the ¥1.2 billion shares using a portion of the proceeds from the disposal of cross-held shares. We allocated the remaining cash to debt repayment and capital efficiency initiatives, strengthening our financial position and reinforcing our commitment to disciplined capital allocation. Specifically, we reduced interest-bearing liabilities by approximately ¥2.0 billion, positioning ourselves to preserve our debt capacity to respond to potential future investment opportunities. Consequently, despite the difficult earnings environment in fiscal 2024, we were able to allocate cash with capital efficiency in mind, stabilizing our financial base

● **First-year initiatives under the basic policy of the Medium-term Management Plan**

1 Sustainable growth of all businesses with an emphasis on profitability

Development of new drivers for growth

- Built a stronger relationship with players in the physical AI-related market
- Expanded share in the Chinese market (9.3% in 2023 → 12.1% in 2024)
  Source: *2024 China Precision Speed Reducer Market Analysis Report*, MIR Co., Ltd.
  Driven by sales to local robot manufacturers in China
- Launched partnerships to cocreate new technologies

Thorough implementation of QCDS+Speed to meet customer expectations

- Launched the company-wide cost innovation project
  Improved fiscal 2024 operating profit by approximately ¥0.3 billion amid persistently high commodity prices and rising labor costs
- Expanded the scope of local assembly in China

2 Strengthened management resources

Greater IoT adoption at factories

- Enhanced operational efficiency due to the launch of the manufacturing execution system at the Ariake Factory
  →To be rolled out to other factories in fiscal 2025 and beyond (expected benefits: indirect human-hours to be reduced by approximately 16,000 h/year)

Efficient allocation of production bases

- Mechatronics product production operations fully transferred to the consolidated subsidiary, Harmonic Winbel Inc.

3 Initiatives to enhance corporate value that will continue into the future

Activities based on the Basic Policy of Sustainability

- Selected for the CDP Water Security A List
- Formulated the HDS Group Policies on Human Rights
- Conducted supplier risk assessments
- Reduced cross-held shares (approximately ¥8.3 billion)
- Established the voluntary Nomination and Remuneration Advisory Committee

while enhancing shareholder returns.

Changes in our earnings structure compared with the past

A comparison of the Group's current earnings structure between the present and past years shows that the break-even sales point has increased remarkably. This is primarily attributable to higher fixed costs, such as greater depreciation and amortization from capital investment, additional labor expenses from increased headcount and wage levels, and higher selling, general and administrative expenses including R&D expenses. In order for a development-oriented manufacturer like the Group to sustain business growth over the medium to long term and continue enhancing its corporate value, it is essential to enhance R&D activities while maintaining a solid financial base and a talent pool that support such activities. As R&D and product development become increasingly complex, the R&D expenses-to-net sales ratio amounted to 6.8% for fiscal 2024. Successful R&D requires more than financial investment; it depends on human resources capable of driving research projects to completion and translating their outcomes into business growth. I am delighted to note that the R&D section now has more younger researchers and has well supported their development. We intend to continue allocating the necessary management resources to stimulate R&D activities, the lifeline of the Group.

Enhancing profitability through top-line growth while maintaining a high marginal profit ratio

The Group's marginal profit ratio has historically been approximately 60%. In recent years, it has shown a gradual downward trend due to inflation, mainly in materials and outsourcing costs, but there have been no remarkable fluctuations.

Although further raising the marginal profit ratio is difficult, in fiscal 2024, we successfully implemented our first price increase in roughly 15 years in the Japanese market, supported by our sales team's efforts to gain customers' understanding of recent increases in our costs. Customer responses varied, and in some cases, we faced difficult negotiations over the proposed price increases. However, I believe that their persistence ultimately helped us secure the understanding of customers.

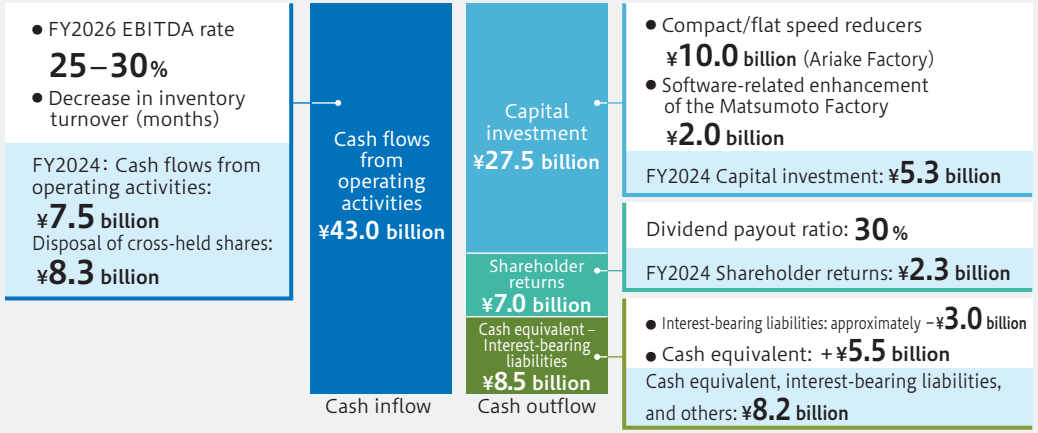
At this point, we have no plans to increase prices in the near term. However, customers are increasingly prepared to accept cost pass-through as society becomes more aware of inflation. We will make appropriate decisions as we carefully assess the management environment and market trends.

We will strive to achieve top-line growth by expanding existing applications and identifying new ones as we maintain the current level of the marginal profit ratio.

Simultaneously, we will leverage the gearing effect of earnings power by minimizing increases in fixed expenses and making efficient use of existing equipment. Through these efforts, we aim to achieve by fiscal 2030 net sales of ¥100.0 billion, an operating profit-to-net sales ratio of 20% or higher, an EBITDA margin of 30% or more, and both ROE and ROIC of 10% or higher (approximately 8% of cost of equity). If I were to share my personal projection on the balance sheet management at the end of fiscal 2030, although retained earnings may increase, we aim to raise dividend payments proportionally and target net assets of approximately ¥120.0 billion through treasury share repurchases and other measures. Regarding interest-bearing liabilities, we will continue scheduled payments of ¥2.0 billion per year while planning new borrowings of ¥10.0 billion to bring the total to approximately ¥15.0 billion. We intend to manage our financial capital policy with a target cash equivalent balance of roughly ¥25.0 billion, equivalent to approximately three months of sales.

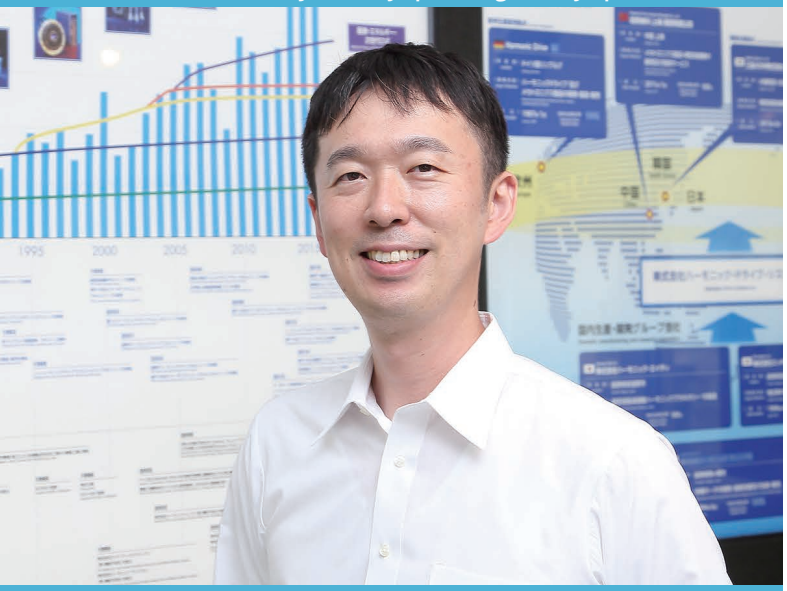
As a group of component manufacturers, we plan to diversify our customer and application portfolios by broadening our application range to reduce our cost of equity (WACC). This approach balances growth with the mitigation of performance fluctuations, helping us limit short-term volatility in our share price and contributing to a lower beta value.

● Cash allocation in the Medium-term Management Plan



Initiatives for Management that is Conscious of Cost of Capital and Stock Price

—Our long-term goal is to achieve this objective by spreading factory-specific ROIC.



Manager
Consolidated Accounting and Tax Group
Finance Accounting, Finance, and Tax Division
Takuro Yoshida

ROIC
(Return on invested capital)
Formula: Net operating profit after tax/Invested capital

An indicator that shows how efficiently a company uses the capital invested in its business activities to generate profits

ROIC tree

A visual presentation of the underlying drivers of ROIC. By breaking the underlying drivers of ROIC into multiple layers, this framework helps identify opportunities for improving business operations and analyzing the efficiency of management resources.

The divisional policy of the finance accounting section mentions “consideration of management indicators that are conscious of capital cost” as one of the key priority issues. In line with this policy, I am working to determine a set of management indicators that use ROIC. A KPI of our long-term vision is “ROIC of 10% or higher on a consolidated basis.” To make this a reality, we need to begin by calculating the ROIC for each Group company and then cascade it to each factory and ultimately to each product category. Each factory within the Group is responsible for different product categories, and their organizational structures vary accordingly. By calculating ROIC for each factory, we aim to develop a clearer understanding of challenges and strengths for each product category and factory.

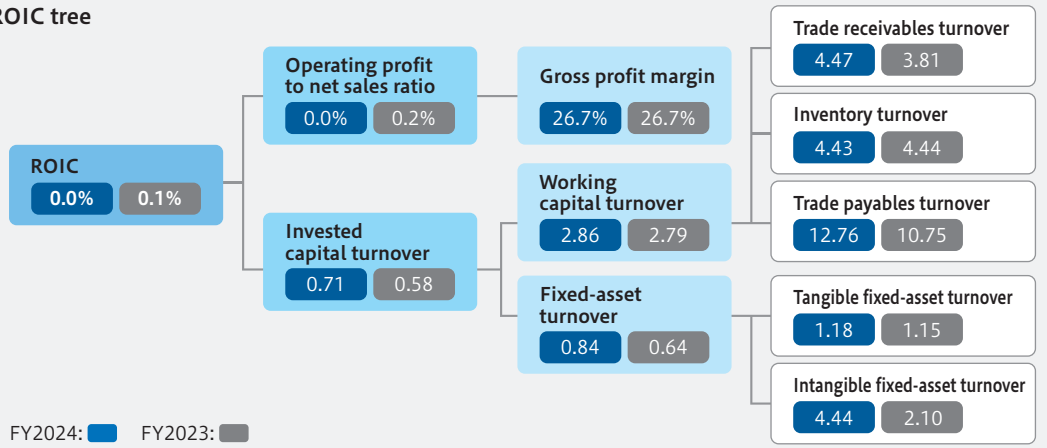
Challenges of factory-specific ROIC and related initiatives

To accomplish major objectives, each underlying driver must be carefully scrutinized and visualized. In other words, a clear understanding of how much profit must be generated to recoup the assets held by and the capital invested in each factory is required. At present, we are building a foundation that will serve as a reliable “yardstick” for this goal. We understand that shareholders and investors expect us to raise ROIC as quickly as possible, but for now, our priority is to solidify the cornerstone. Analysis data for each factory must be both detailed and accurate to improve the accuracy of investment decisions. However, we have yet to generate sufficiently accurate data on each individual factory. Systematically compiling financial information from the investment efficiency perspective is a new challenge for the Company.

The finance accounting section’s project for developing management indicators that use ROIC has been in full swing since the beginning of fiscal 2024. We are currently engaged in repeated discussions to quantify and prioritize drivers, and we are preparing to announce concrete numerical targets. It is safe to say that we now have a solid framework for calculating the ROIC for each company. The next key project theme is to accelerate factory-specific programs. To this end, we conduct analysis with the characteristics of each factory’s business in mind.

Multiple elements, such as inventory, turnover of trade receivables, and capital invested, affect ROIC; therefore, it requires a cross-sectional review. For example, if the time to collect trade receivables is long, we need to work with the sales section. If excess inventories are held, we need to speak with the procurement section. One element with the greatest effect is the amount of investment, and the critical question is whether it surpasses the 8% cost of capital (weighted average cost of capital, WACC). We will carefully consider the optimal size of investments to meet the

● ROIC tree



expectations of shareholders and investors. Furthermore, we are developing a framework that anticipates not only profit and loss plans but also the recoupment of invested capital to ensure that ROIC consistently exceeds capital cost.

The goal of factory-specific ROIC management

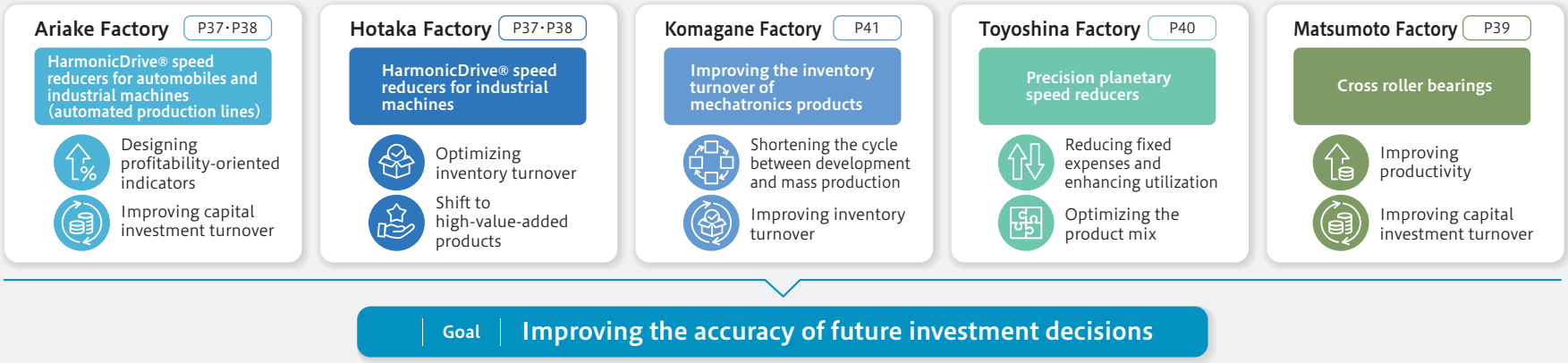
Because no two factories share the same business characteristics, the ROIC that each should target naturally differs. For instance, the Ariake Factory has considerable invested capital as it has installed automated lines, but its utilization remains low due to weak orders. In contrast, the Hotaka Factory has more modest invested capital, as much of its production is performed manually, but its diverse product mix makes managing inventory turnover challenging. The Toyoshina Factory specializes in the production of precision planetary speed reducers and operates with a straightforward line configuration. The Komagane Factory is responsible for manufacturing high-value-added mechatronics products that deliver high profitability, but see a profit decline if output falls. Therefore, we decided not to set a uniform ROIC target. Instead, we aim to visualize ROIC for each factory according to its business characteristics so that everyone can align on the same improvement direction. This approach enables each factory and section to evaluate their activities through the lens of ROIC by clarifying areas for improvement.

We do not assume the introduction of a new system for ROIC visualization. Rather, the finance accounting section is taking the lead in sorting and reorganizing the existing data. We are working to build a system that visualizes data more efficiently and effectively while using data accumulated in ERP systems and elsewhere. In the long run, we aim to create a workplace environment where employees naturally develop ROIC awareness through shared operation processes and training opportunities. Ultimately, we will incorporate ROIC into our monthly management processes through ROIC visualization and lay the groundwork for a system that enables management to quickly identify issues and make timely decisions at the monthly Business Process Innovation Meeting, which is attended by all section heads and above. Equally important is strengthening post-investment follow-up and monitoring. We aim to improve the accuracy of future investment decisions by enabling the continuous monitoring of ROIC at the factory and business levels.

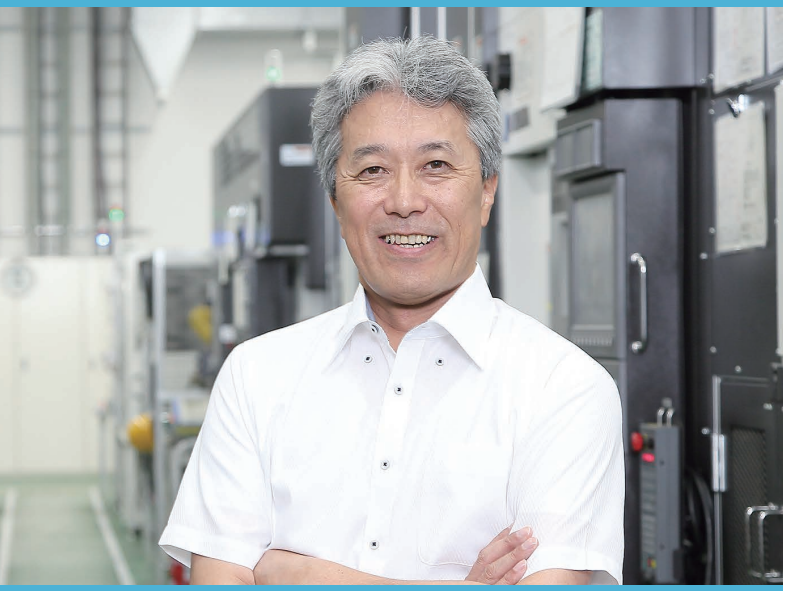
Spreading the metric in-house and enhancing corporate value

Introducing ROIC is not simply about adding a new metric. Rather, it represents a shift in management perspective, from "maximizing sales and profits" to "maximizing the efficient use of limited capital." Although ROIC may appear complex at first glance, breaking down its underlying drivers into clear, easy-to-understand components allows the concept to spread across the organization. All of its drivers, such as inventory turnover, collection time for trade receivables, and fixed-asset turnover, are closely linked to daily operations. If every employee pays attention to these familiar indicators and reflects on their day-to-day actions, ROIC will naturally improve. Take the management of consumables at factories as an example. If teams place excess orders simply because they have a surplus budget, management becomes cumbersome and storage space becomes tight. This results in lower ROIC. In contrast, if orders are placed in the right quantities, expenses decrease and the Company's assets are used more efficiently. If we continue making these incremental improvements, we can enhance the ROIC. In the future, we aim to foster a corporate culture in which employees and management alike share a common question, "Is this factory generating returns commensurate with the investment?," using ROIC as a common yardstick and a basis for discussion. Through these initiatives, we seek to embed a management mindset that is conscious of cost of capital into the Company, thereby contributing to the sustainable enhancement of corporate value.

● **Framework of ROIC monthly management for each factory and goals (drafts under discussion)**



Message from the Officer in Charge of Production Technology



Executive Officer
General Manager of
Production Technology Division
Hiroki Hanaoka

Through redefining manufacturing, we will pursue next-generation manufacturing and optimize our production equipment while building a next-generation production model that meets global standards.

We will redefine manufacturing through our company-wide cost innovation project.

We will fundamentally reform the conventional manufacturing approach through our company-wide cost innovation project. We are pursuing the possibility of deploying high-precision, space-saving, and low-cost machines by breaking away from the conventional preconceptions about equipment. For example, in the gear cutting field, we have an ongoing joint development project with a small but technologically advanced partner to select equipment that meets our new price and footprint targets while maintaining comparable precision with our existing machines. On the material side, we have partnered with quality assurance and development sections to start re-assessing raw materials that were previously deemed unchangeable. In addition, we are working to achieve “non-cutting manufacturing” by using thinner-walled forged materials and combining them with lamination technologies.

While orders were stagnant, we began to more effectively utilize our existing equipment.

Since fiscal 2024 was the first year of our company-wide cost innovation project, our quantitative progress was limited. Some of the newly deployed equipment remained underutilized or unused due to declines in orders and postponements of special projects. Given this situation, we are globally optimizing the deployment of our existing machines while minimizing unnecessary capital investments. Specifically, we are updating the specifications of our existing machines for our promising new mobility project while adapting them for Harmonic AD, a precision planetary speed reducer company. In anticipation of the next wave of demand recovery, we are seeking to enhance our profitability by effectively utilizing our fixed assets and improving the utilization rate.

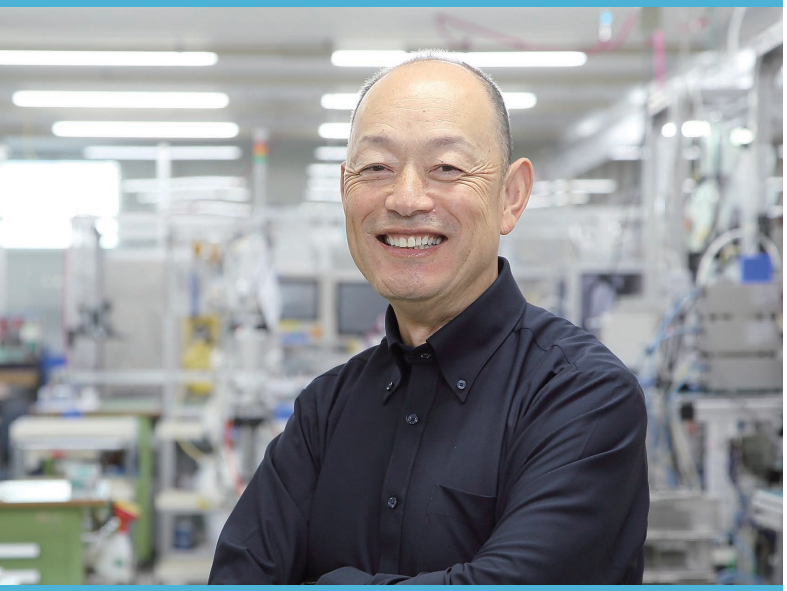
We will solve material issues and execute aggressive collaboration strategies.

We are also steadily making progress in addressing material issues, including quantifying quality and quickly responding to measurement issues. Specifically, we are progressing in quantitatively evaluating triple tooth contact and digitizing/utilizing defect detection data, thereby enhancing quality. Regarding cost efficiency and market adaptivity, we are strategically expanding into the Chinese robotics market through a collaboration with a Chinese manufacturer. At the same time, we are carefully assessing Chinese products through performance and durability tests to determine whether or not to employ them. We aim to enhance our competitiveness while maintaining the premise of ensuring HDS Group quality standards even for lower-priced models.

Through global collaborations, we will take on the challenge of establishing the next-generation production model.

The automation rate, which is our current focus area, has been steadily improving. Year-over-year, we saw a modest increase of 1.2%, despite the low utilization rate. Breaking it down by the equipment automation level across processes, Level 1 (requiring manual loading/unloading) dropped 0.7%, and Level 2 (equipped with automatic loading/unloading capabilities) improved by 1.0%. While Level 3 (equipped with automatic loading/unloading and inspection capabilities) fell by 0.7%, Level 4 (interconnected equipment) improved by 1.0%, demonstrating a gradual shift toward more sophisticated automation levels overall. Note that our goal is not to fully automate all processes but to optimally automate them for each product and customer. Based on this flexible policy, we are organizing a global production engineering conference in Germany this November, where production technology staff from our three major hubs, Japan, Germany, and the U.S., will meet. We will continue building the next-generation production model by sharing global insights.

Message from the Officer in Charge of Production



Executive Officer
(In Charge of Production, Production Planning)
General Manager of First Production Division
Tsuyoshi Awaduhara

In addition to building customer trust, we aim to maximize our output during the next demand recovery period by enhancing productivity and making structural improvements to address product non-conformances led by production floor teams.

Driven by the production floor, we will further enhance our operational visibility by promoting digital transformation and automation efforts.

While the Ariake Factory has been completely automated ahead of other locations, the Hotaka Factory is gradually automating the operations through digital transformation in anticipation of fully implementing the manufacturing execution system (MES) in two years. Through collaboration with the ICT division, our manufacturing engineers have visualized about 30 production data items on the motion board and have successfully linked it with Facteye, an equipment utilization monitoring system, and XC Gate, which enables users to detect and analyze causes of product non-conformances. This has established an environment where daily operational processes can be centrally managed on the monitor. We can now track real-time production progress from upstream to downstream while visualizing quality information. Through these initiatives, we expect to increase the utilization rate of the Hotaka Factory by 20 to 30% in the future.

We are committed to fully involving production floor staff in our efforts to upskill employees and improve productivity.

At the Hotaka Factory, we have established a productivity index (work efficiency) as a KPI, and we quantitatively track labor productivity based on hours invested and recovered. In fiscal 2024, despite a decrease in work volume, we achieved a 3% increase in productivity year over year. In addition, we are steadily making progress in multi-skilling our staff to handle multiple processes. In addition to traditional OJT, we have newly implemented a written exam to improve their skills. This initiative has improved their practical skills and helped them acquire quantitative knowledge of machine cutting parameters and other relevant expertise, thereby lowering the risk of equipment damage and other problems. We also see tangible progress in upskilling employees; 10% of the staff advanced from Levels 1 and 2 (requiring assistance) to Level 3 (able to work independently), increasing the total number of Level 3 staff by 20%.

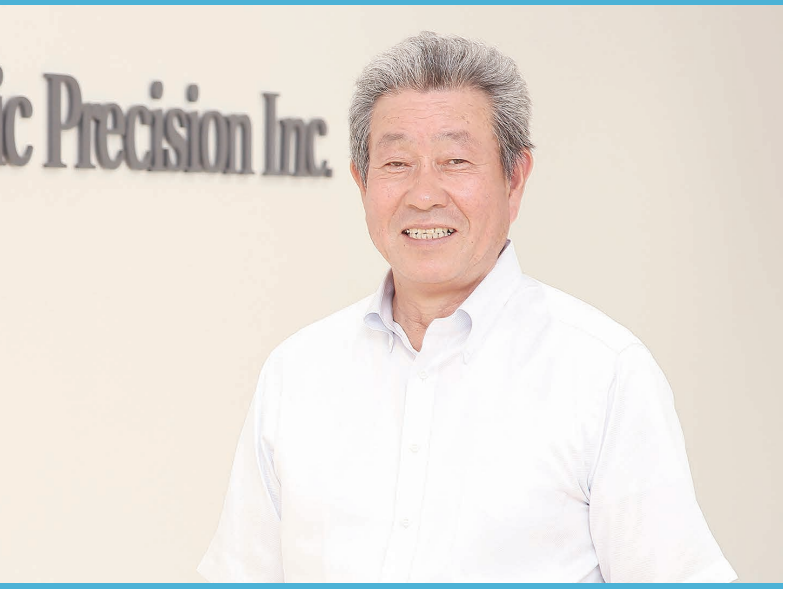
We aim to accelerate standardization and radical improvements to reduce the number of non-conforming products.

The production section is advancing its efforts to reduce the number product non-conformances caused by human error. In fiscal 2024, the internal non-conformance count decreased 43% year over year. In particular, for the assembly process, we conduct thorough analysis to identify where non-conformances occur and why. We standardize the workflow and reflect the findings in the operation sheet to prevent recurrences. Previously, we mostly replaced defective products, but today, we make structural improvements by identifying the causes of defects. Through this initiative, we have embedded individuals' insights as organizational knowledge, thereby improving the quality of production floor operations. In fiscal 2025, we aim to roll out this initiative across divisions and further reduce the number of non-conforming products by 50%.

We will build customer trust and implement an integrated proactive and defensive production strategy.

At the Hotaka Factory and the Ariake Factory, we actively encourage customers to take facility tours so they can see our initiatives and we can win their trust. There were approximately 80 facility tours in fiscal 2024, including both domestic and international visitors, representing a twofold increase from the year before. Visitors have high regard for our ability to meet tight deadlines and quality enhancement initiatives, and this often leads to technological exchanges and business collaborations. Going forward, we plan to utilize co-bots that perform bolt tightening, gluing, and greasing and to build flexible lines that are suitable for high-mix, low-volume production. Simultaneously, we will continue seeking improvements in defensive areas, such as on-time delivery rates and consistent quality of general-purpose products. We also aim to further enhance our on-time delivery rate for rush orders.

Message from the President of Harmonic Precision Inc.



President
Harmonic Precision Inc.
Tetsuaki Maruyama

Cross roller bearing

Taking pride in the importance of manufacturing cross roller bearings internally, we aim to further strengthen operational autonomy. To this end, we will develop new products and expand our customer base by leveraging our unique strengths.

Adjusting to sudden demand fluctuations without compromising quality

For the HDS Group, the in-house manufacturing of cross roller bearings, one of the key components of speed reducers, is of major importance, as it enables us to maintain high quality while responding flexibly to fluctuations in orders. Harmonic Precision was established in July 1999 based on the strategic importance of internally manufacturing cross roller bearings, as sourcing them from external bearing manufacturers limited our ability to quickly adjust to sudden changes in delivery schedules and quantities. We now have in place an in-house system capable of completing production within two weeks of receiving the blank materials. If we relied on outside suppliers, we would need to give provisional notice at least three months in advance, which would considerably limit our flexibility in meeting production requirements. Although the overall quality difference between our products and those purchased is small, our proprietary cross roller bearings with an integrated outer raceway provide superior grease sealing and stiffness. We work with two vendors to ensure stable procurement of rollers, which allows us to absorb demand fluctuations and maintain business continuity.

Strengthening external sales through the acquisition of new customers

In the current weak demand environment, we produce approximately 40,000 cross roller bearings per month. In terms of capacity, monthly outputs could reach 110,000 units, but with the workforce currently in place, production can stably reach up to 70,000 units per month. We supply bearings to HDSI and Harmonic AD, which mainly produce HarmonicDrive® strain wave gears and precision planetary speed reducers, respectively. However, we have recently begun supplying customers outside our Group. For example, one medical equipment manufacturer that previously used HarmonicDrive® products but purchased bearings from another brand has now started evaluating ours after we successfully persuaded them to source from us as well. Although Harmonic Precision does not have its own sales section, we are working closely with HDSI's sales team to acquire new customers. Our key strengths include competitive prices, responsive prototype studies, quick delivery, and reliable quality assurance.

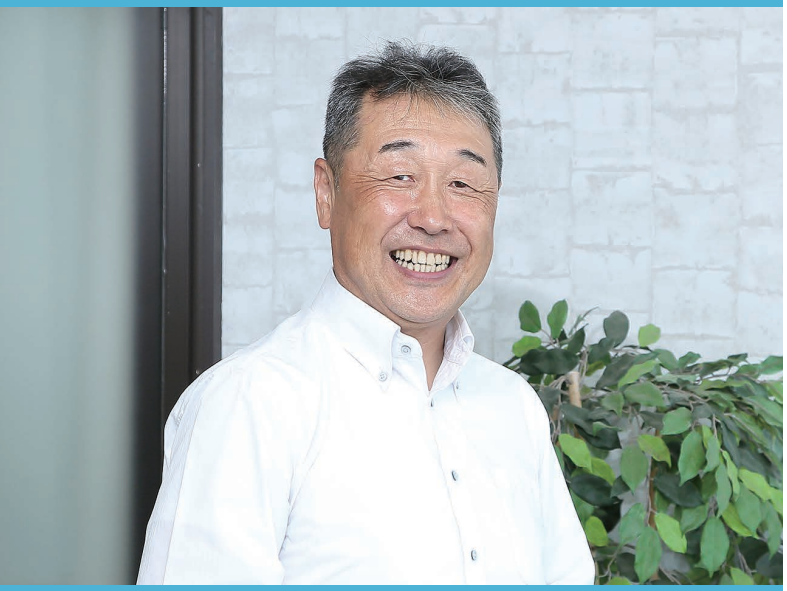
Providing an employee-friendly workplace environment

We have approximately 200 employees, 52% of whom are women, and we are committed to supporting their advancement into managerial positions. Our workforce also includes 35 skilled workers from Vietnam. Given the high number of female applicants for assembly positions, we designed a welcoming workplace with amenities such as a comfortable cafeteria and a robust paid leave program. At Harmonic Precision, the percentage of employees who took paid leave is as high as 95%, and we offer flexible work arrangements. Simultaneously, recruiting new talents and developing successors remain pressing challenges. First, we urgently need to train production engineers skilled in jig design. We also see the need to foster greater unity between direct and indirect employees and strengthen our ability to make strategic proposals.

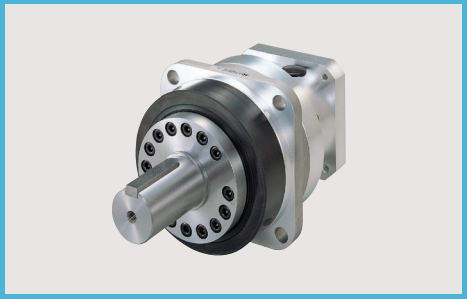
Taking on the challenges of developing new products to realize autonomous corporate management

Harmonic Precision embraces the vision of "evolving from a mere contract manufacturer into a proposal-oriented company" and is steadily working toward that goal. To this end, we make it a practice to respond flexibly to changing times and customer needs, taking proactive steps such as adopting new materials that we had never used before and exploring innovative design and manufacturing methods. By proactively drawing on external expertise, we aim to become a company chosen by customers for our technological innovation and superior service quality. Furthermore, by delivering the distinctive value of our proprietary products, such as light weight, high stiffness, and exceptional durability, while maintaining timely delivery and consistent quality, we seek to increase the share of sales to non-group companies over the long term and establish autonomous business operations.

Message from the President of Harmonic AD, Inc.



President
Harmonic AD, Inc.
Masakatsu Ohashi



HPG-R series gearhead

We remain focused on achieving sustainable growth by exploring new customers and applications and pursuing manufacturing innovation led by our younger engineers and skilled workers while leveraging our distinctive strengths.

We currently hold a market share of 30% or over in Japan's precision planetary speed reducer segment.

Harmonic AD, established in 2003 as a spin-off from a division of HDSI, manufactures precision planetary speed reducers for servo motors. Although we were a latecomer to this market, we have minimized power transmission loss and improved durability by applying thin elastic gear technology to the internal gears of our planetary speed reducers, successfully reducing backlash to no more than three arc minutes. Our other distinctive strengths include a short-lead-time delivery system that enables us to supply catalog products in as little as one week and a high level of reliability supported by 100% inspection, which we believe give customers strong peace of mind. In the Japanese market for precision planetary speed reducers with lower reduction ratios, our penetration is estimated at 30% or higher.

Our core business is OEM supply for leading servo motor manufacturers.

We manage our inventories at the component level. By maintaining a stock equivalent to approximately two months of sales, we can deliver products within one week. Close communication with each supplier is maintained to optimize component inventory levels. For example, we share long-term production plans with suppliers for components with long lead times, such as needle bearings, to ensure stable procurement. At present, our sales mainly consist of catalog products. Approximately one-third of our sales come from OEM products supplied to key servo motor manufacturers, and the remainder are delivered to a wide range of general industrial applications, including machine tools, transportation, packaging, and battery manufacturing equipment, along with a number of customized products. For pricing reasons, we currently do not sell online.

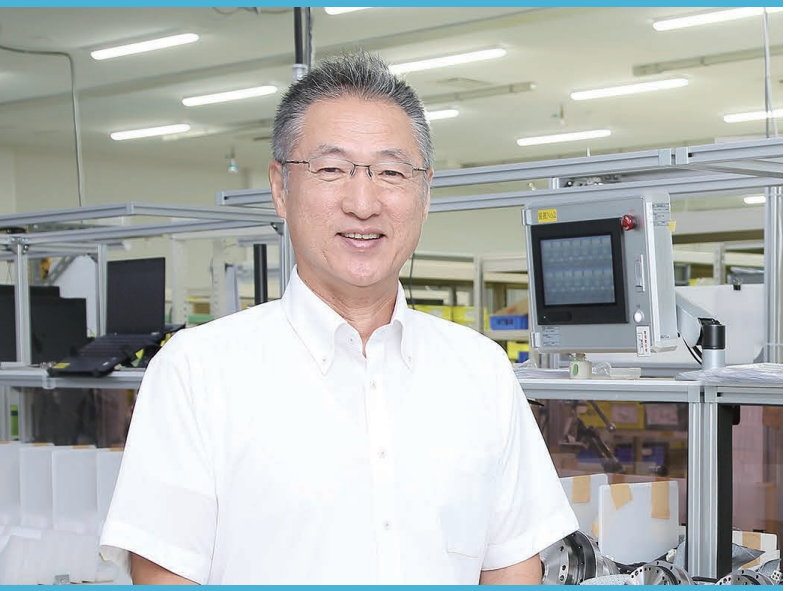
We are also preparing to conduct a major reform of our manufacturing methods.

Harmonic AD is fortunate to have many highly skilled employees who actively take on challenging skill certification exams. We encourage them to pursue these qualifications in the hope that the insights gained through preparation will be applied in their daily work. Currently, we use a cell manufacturing system in which products are assembled manually, producing between 5,000–6,000 units per month against a total production capacity of up to 10,000 units. We are promoting various automation initiatives to enhance productivity and ease workloads. A project to fully automate the planetary shaft press-fit process is now underway. We also reviewed the processing method used for internal gear cutting. With the aim of introducing a new approach that will remarkably improve processing speed, preparations for equipment installation have already begun.

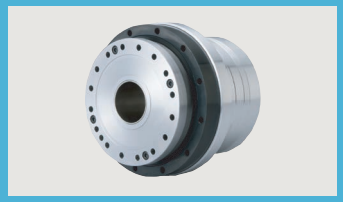
Acquiring new customers is the key to sustainable growth.

We aspire to be a company that delivers products that contribute to society—one in which employees take pride in being part of the organization. Approximately 60 people are currently employed at Harmonic AD. Our current focus is on placing the right people in the right positions and developing younger employees. Alongside improving workplace comfort, we are stepping up efforts to nurture future managerial candidates, who are currently in short supply. New human resource development initiatives have also been initiated, including exchange training programs with our South Korean subsidiary, SAMICK ADM Co., Ltd., and personnel exchange with HDSI. Because we do not have a sales team of our own, our present challenge is determining how best to reach new customers who require customized products. In this regard, we are seeing steady growth in the sales of our products used in automobile production lines and special-purpose robots. Simultaneously, a leading machine tool manufacturer has approached us more frequently with requests such as replacing in-house gears with purchased ones and other customized solutions. Our goal is to achieve sustainable growth by expanding our customer base and broadening our product applications.

Message from the President of Harmonic Winbel Inc.



President
Harmonic Winbel Inc.
Takahisa Tezuka



SHA series AC servo actuator
Hollow Shaft & Flat Type

RH series
DC servo actuator

Continuing to hone our strength in motor technology, we aim to stabilize business performance and reinforce our profit-generating structure by enhancing profitability and expanding external sales.

The founding spirit and steps toward making mechatronics a core business

Since our foundation in 1994, Harmonic Winbel has been mainly involved in developing and designing motors and in supporting the start-up of mass production. In May 2007, we entered into a capital and business alliance with HDSI, reflecting their intention to strengthen the mechatronics business. In April 2023, we changed our trade name from Winbel Co., Ltd. to Harmonic Winbel Inc. following the transfer of production for mechatronics products previously manufactured by HDSI, such as servo motors, actuators, and drivers. Our diverse product portfolio now includes brushless, built-in, and AC/DC servo motors. Currently, 85% of our products are supplied to HDSI, with the remaining 15% being sold to other customers. For these non-HDSI customers, we provide high-precision compact motors used in dialysis system cleanup pumps and machine tools.

Youth-led shop floor and initiatives to strengthen production

We are a youth-driven company with approximately 80 employees and an average age of 37 years. Although many of our employees are still developing their skills due to relatively short tenure, we are actively promoting multiskilling and other initiatives to enhance productivity. Currently, our monthly output is 10,000 units, exceeding our nominal production capacity of 9,000 units. Our objective is to increase production with the current workforce by approximately 20–30% through process improvements, including the introduction of semiautomated equipment and automated adhesive application machines. In 2023, we also began developing personnel systems and a new performance evaluation framework. We are building a foundation that supports development and mass production while stabilizing the organization. Simultaneously, we face challenges in transferring organizational knowledge and recruiting human resources strategically, including shortages of midlevel engineers and stagnating development capabilities. With the expertise of employees seconded from HDSI, we aim to operate the company independently.

Pursuing a competitive edge, sales expansion strategy, and sustainable manufacturing

Our competitive advantage lies in our ability to meet diverse specifications, such as high precision, compactness, and flatness, and in our actuator technology that integrates speed reducers and motor encoders. Our flexible design capability continues to be highly valued, whether for flat designs, split structures, or other customer-specific requirements. Recognizing the risks of our heavy dependence on business with HDSI, we have made a concerted effort to strengthen sales to external customers, aiming to secure one or two proposal-based mass production projects each year. Although we do not have a dedicated sales team, we are actively pursuing new customers by renewing our corporate website and strengthening our technological appeal. Regarding quality, we have declared a goal of " zero failures." To achieve this, we are fostering a corporate culture in which every employee clearly understands how our products are used and in which production, design, and procurement teams work together to build quality into every process.

Remaining committed to growth and sustainable operations

We celebrated our 30th anniversary in 2023. Since our founding, our strength has been the ability to offer development proposals that closely align with customer needs. However, in recent years, we have recognized that we may not have been as proactive as we would like in bringing new products to the market, instead relying on existing offerings, which we view as a challenge to overcome. Fiscal 2024 closed in the red, primarily due to a decline in HDSI orders and the burden of up-front investment. We aim to return to profitability in fiscal 2025, targeting net sales of approximately ¥3.0 billion. We remain committed to stabilizing our performance and reinforcing our profit-generating structure by handling HDSI projects with confidence and expanding our portfolio of external customer projects, which tend to have higher marginal profit ratios. Simultaneously, we strive to better support global projects, including those in China and other regions. As a "sommelier" of motors, we strive to deliver the most optimal solutions to our customers.

Message from the President of HD Logistics, Inc.

President
HD Logistics, Inc.
Kazuya Narita

Designing ecofriendly packaging materials

By using structured cardboard, we have replaced petroleum-based molds, reduced tape usage, and saved space, which allows us to lower costs.

Serving as the final checkpoint before product shipment within the HDS Group, we aim to evolve into a comprehensive logistics service provider guided by our 2035 vision, which seeks to maximize our strengths in alignment with the Group's Mission.

Background of the foundation and corporate mission: Providing logistics services as the last checkpoint

HD Logistics, Inc. (HDL) was established in April 1999 as a wholly owned subsidiary of HDSI and marked its 26th anniversary in 2025. We currently employ 113 people, including temporary staff, and provide shipment, packaging, and other services on a contractual basis. Operating across five business sites, we provide logistics and administrative services for HDSI and Group companies. As HDL is a spin-off from HDSI's shipment center, we uphold the mission of "delivering HDSI's brand value and quality to customers." In line with this mission, we perform our duties with full awareness of our responsibility as the Group's final checkpoint.

Expanding business domains to achieve the 2035 vision

HDL, as a logistics subsidiary of HDSI, covers a broad range of operations. In addition to packaging and shipping after outgoing inspections, we manage inbound-outbound inventory, handle certain in-process operations excluding manufacturing, and provide administrative services for HDSI on a contractual basis, such as calibration of measuring instruments and processing shipment and trade documentation. Going forward, we aspire to evolve into a comprehensive logistics service provider that delivers new value rather than simply functioning as a contract logistics business, formulating our long-term vision for fiscal 2035. To realize this vision, we have identified two priority policies for fiscal 2025: "establishing the HDL brand" and "strengthening our proposal capabilities." Moving beyond an organizational structure that depends on individual leadership, we now focus on reinforcing the foundation of the organization.

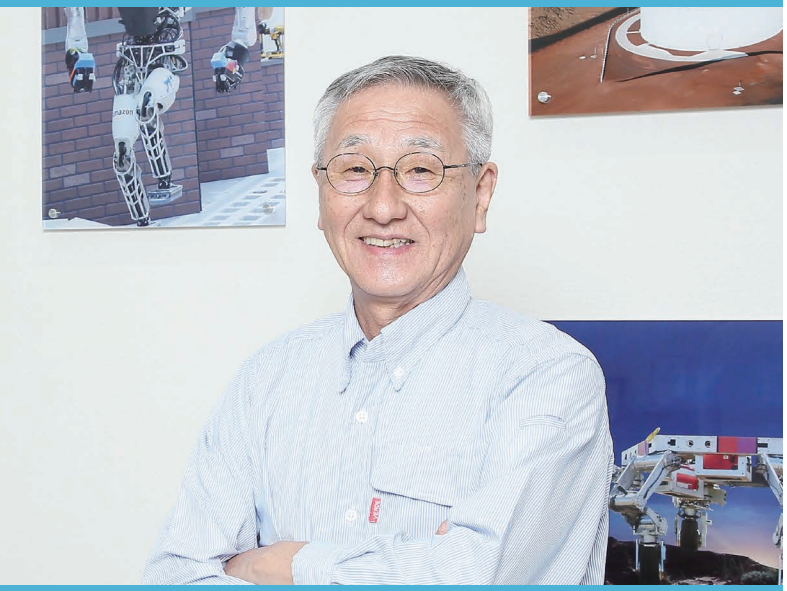
Promoting business process innovation through organizational reform and automation

Given the nature of our services, we assign personnel to the factories of Group companies, where they perform on-site duties. We also plan to recruit new graduates in the coming years. Our goal is to build an organizational structure that promotes employee retention and fosters autonomous growth while enhancing workplace comfort and overall job satisfaction. We also invest in automation and efficiency improvements. Current initiatives include studying ways to automate the packaging process and exploring the introduction of an automated delivery system using autonomous mobile robots. Although transportation and delivery are currently outsourced, we will continue to evaluate the feasibility of handling regular shipment in-house in the future.

Driving growth through value creation and strategic reform

As part of our "defensive" strategy, we aim to strengthen our responsiveness to quality and cost requirements by regularly gathering feedback from HDSI and other Group companies. Simultaneously, we are reinforcing our human capital by developing younger employees and converting temporary staff to regular employment. On the "offensive" side, we have partially revised our traditional contracted service business model, launching initiatives to further enhance profitability for both HDL and the HDS Group. We have also developed proposals for ecofriendly packaging materials and methods that enhance the corporate value of HDL and HDS Group companies, some of which HDSI has already adopted. Through these initiatives, we contribute to reducing the environmental impact of HDS Group customers. Beyond that, we have begun negotiating improvements in unit prices for our contracted services and seeking new orders, including from non-Group customers, to strengthen our ability to generate profits independently. Moving forward, we aim to make our presence felt more strongly as a true value-creating company no longer the unsung hero but a recognized driver of progress within the group.

Message from the Chief Technical Officer and Quality Officer



Executive Fellow Officer
(Chief Technical Officer)
(In Charge of Engineering and Quality)
General Manager of Quality Assurance Division
Yoshihide Kiyosawa

Topics

At the Global Innovation & Quality Award hosted by Nissan Motor Company in 2024, we received the Japan Regional Quality Award in the ENGINE & DRIVE category. The high quality of our products was positively acknowledged, resulting in us being chosen from numerous suppliers in the same category.

The HDS Group's quality culture is based on proactive and defensive quality strategies, which involve committing to manufacturing excellence at the nexus of technology and quality and turning trust in our integrity into an asset.

The essence of manufacturing excellence where technology meets quality

When I started my career as an engineer, my relationship with the quality assurance section was not always smooth. Our efforts to adopt new technologies have often been tightly constrained by quality requirements, leading to occasional friction. Now that I've assumed my current position, I realize that technologies are for achieving capabilities that customers want, whereas quality control is about making defect-free products. When both aspects align, we can sustain stable performance. However, this is not easy to achieve. Historically, we converted American-specification drawings from inches to millimeters and made micron-level machining our standard, a foundation that continues to define us today. This culture is embedded in our DNA, and our techniques based on sensory perceptions and tactile feedback achieve unique quality that is unmatched by machines. Craftspeople's tactile feedback is difficult to quantify and impossible to completely replace with machines. In fact, we once tried implementing a production approach independent of human senses at the Germany subsidiary. In the end, however, we had to rely on human sensory perceptions.

Customer satisfaction as a performance indicator for the quality assurance division

Since I started overseeing the quality assurance section four years ago, my commitment to eliminating wasteful inspections has not changed. The true purpose of enhancing inspections is not to detect defects; rather, it is to prevent making non-conforming products. Although it is not easy to thoroughly investigate causes and prevent non-conformances, we are steadily making improvements by learning from errors and preventing recurrences. Production floor staff now consult with us more frequently, indicating that our relationship has evolved from adversarial to collaborative, with both parties working together to solve problems. Not all values sought by customers can be quantified, but there is one expectation common to all of them: delivering consistent performance. To meet their expectations, we clearly distinguish quality assurance and quality control, with the former dedicated to ensuring customer satisfaction and the latter to preventing non-conformances.

Approaching quality control with sincerity to turn trust into assets

Through these measures, we have successfully reduced the time that the sales division spends on quality issues, allowing them to focus on proactive sales activities. There have been instances where candidly reporting product defects and taking quick actions have led to strengthened trust and additional orders. The quality assurance section now includes personnel with development experience who analyze causes and work with production floor staff to solve problems, a culture that has been embedded in our organization. We also focus on improving quality at affiliated companies and have enhanced product quality throughout the supply chain by simplifying inspection work. While we sometimes saw finger pointing in the past, we now have a quality culture that encourages taking on challenges and where people share mistakes to make improvements.

The future of the HDS Group's quality control is underpinned by bold initiatives and stability

Our Group is working on proactive quality enhancement strategies, including production yield improvements and accelerated deliveries, while maintaining a 100% share in challenging fields like aerospace applications. Meanwhile, for mass-produced products, we are focusing on defensive quality control measures through our company-wide cost innovation project to eliminate wasteful production and achieve manufacturing standards that do not require inspections. There was an instance where a quality issue occurred shortly after receiving praise from a customer, but we were able to recover trust through our sincere actions. Continuously pursuing consistent performance, lower costs, and enhanced reliability, this approach forms the core of our Group's quality culture.

Message from the President of Ome Iron Casting Co., Ltd.

We are committed to contributing to global technological development by supplying the world's highest-quality materials with employees whose passion burns as hot as molten iron.

President
Ome Iron Casting Co., Ltd.
Takuro Miyoshi

Our mission and growth strategy

In 2008, Ome Iron Casting entered into a capital and business alliance with HDSI to ensure a stable supply of cast iron for circular splines, one of the key components of the HarmonicDrive® ultraprecision strain wave gears, and to accelerate the development of new technologies and products. Currently, cast components for circular splines (cast iron) and other products supplied to the HDS Group account for approximately 60% of our net sales, most of which are used in the robotics business. Additionally, our products are highly valued by customers across industrial sectors, including valves, civil engineering, playground equipment fittings, refrigeration facilities, and construction equipment. Thus, our technological foundation has spread into different fields. We position the robotics business as the core of our management strategy. Simultaneously, by proactively expanding our customer base, we aim to acquire new expertise and technical know-how, further strengthening our supply stability.

Our proprietary technologies enable patented material compositions and superior material quality.

Our greatest strength lies in the high-strength ductile cast iron used in the circular spline of the HarmonicDrive®.This material features patented compositions that deliver exceptional wear resistance and high strength that no other competitors can replicate, giving us a distinct competitive edge. Spheroidal graphite cast iron is typically heat-treated to stabilize its metal structure and properties. However, we have achieved stable mass production by eliminating this heat treatment process and applying an unconventional alloy design in combination with our proprietary expertise. The required quality of raw material and process control is extremely high, creating a natural entry barrier. Our quality assurance system is equally rigorous. In addition to lot-by-lot tension testing, sampling-based hardness measurements and 100% metallurgical inspections are conducted in accordance with the Japan Industrial Standard to meet the precise hardness criteria required for ductile cast iron. Only cast-iron products that pass these stringent evaluations are used in HarmonicDrive® circular splines.

Exploring new applications in untapped markets

Beyond the robotics field, ductile cast iron has been adopted on a trial basis for noise reduction in railway engine drive gears, with ongoing R&D aimed at enabling future mass production. We are also receiving an increasing number of requests for prototype studies and joint development across a wide range of fields, driven by the global push for improved fuel efficiency and weight reduction to support carbon neutrality and accelerated infrastructure development in response to more frequent natural disasters. As we expand into these new application areas, we take the utmost care in guiding each project toward mass production. This heat-treatment-free ductile cast iron is a valuable asset developed by our former president and predecessors through hundreds of melting trials and repeated experimentation. To carry these achievements forward to the next generation, every employee continues to challenge themselves and refine their skills with the shared goal of achieving truly "world-class material compositions."

The value people create and our corporate culture

Our greatest strength and most important asset are our people: employees who dedicate themselves to their craft and work tirelessly under the intense heat of the foundry. Maintaining business stability is essential to preserve this invaluable asset. Achieving this begins with taking exceptional care of our customers and earning their trust. At every morning assembly, we remind our employees of the importance of "cheerfully greeting" everyone who visits our facilities, including customers, suppliers, mail carriers, catering staff, transport operators, and local community members. This practice is far more than a formality; it represents the first step in building trust with our community and directly contributes to higher customer satisfaction.
I believe that connecting these accomplishments to employees' and their families' happiness embodies our corporate culture and forms the foundation for future prosperity.

Pouring process

Management Based on Ceaseless R&D and Constant Emphasis on Quality

As a basic principle, the HDS Group prioritizes “ceaseless research and development activities” and “a constant emphasis on quality,” as a foundation to its management aiming to create attractive products that satisfy our customers and provide services from the perspective of our customers.

R&D Organization

The R&D organization comprises the New Mechanism Principle Laboratory, which conducts R&D of new principles and mechanisms, free from the boundaries of existing products and technologies; the Harmonic Drive Laboratory, which conducts preemptive research and product development based on future forecasts with a focus on deepening and expanding core technologies; the Development and Engineering Division, which develops and designs products based on customer requests; and the Production Technology Division, which conducts R&D of the methods and equipment required for product manufacturing.

This system enables us not only to meet diverse customer requests but also to conduct preemptive R&D for the future, pursue fundamental technologies that form the basis of all R&D, and actively engage in studying new principles and mechanisms capable of delivering innovative value to customers in the future. We are building a system capable of adapting to the rapid changes of today.

Furthermore, to enable agile customer response and to accelerate technological development, our business operations are conducted through the close collaborations among the three sections of sales, development and production. Also, we pursue technological development aiming to establish new technologies through the collaboration among the industry, government, and academia.

Quality Promotion Organization

In the HDS Group, the head of quality assurance of Harmonic Drive Systems Inc. supervises the quality of our branded products across group companies, shares policies, and ensures the promotion of initiatives.

To enhance the quality level of all matters related to our branded products such as development, production, and service, the head of quality assurance grasps the quality status of each company through the quality assurance divisions of each group company, and receives quality reports, including critical quality issues, in the regular quality meetings held every month at each company. Through such efforts, the HDS Group supervises quality information. Furthermore, through the quality assurance divisions in each group company, we guide and supervise domestic and international factories, suppliers, and partner companies entrusted with manufacturing.

All group companies involved in manufacturing are certified with ISO9001, the international standard for quality management systems, and we are committed to maintaining and improving a quality assurance system for the stable delivery of high-quality products.

Five strengths of the HDS Group that serve in meeting customer expectations

(1) Accumulated technologies and skills related to strain wave gearing, HarmonicDrive®

We believe that the development technologies, production technologies, processing and assembly technologies and skills, and production systems that we have built up for more than 50 years since our foundation in pursuit of expanding the potential of speed reducers, are the HDS Group’s greatest strength.

(2) A product lineup providing compact size, light weight, and high accuracy

The mechatronics products and speed reducers are being chosen by customers who seek advanced levels of motion control and more compact, lightweight equipment. We provide differentiated added value that would be difficult to achieve with any other mechanisms across a wide range of applications.

(3) Core technology enabling the provision of total motion control

The HDS Group has built up total motion control technologies and skills through R&D and production of mechatronics products that integrate speed reducers, motors, sensors, drivers, controllers, and other system elements. The resulting tangible and intangible technologies and skills related to core technology are the source of the competitive advantage of the HDS Group.

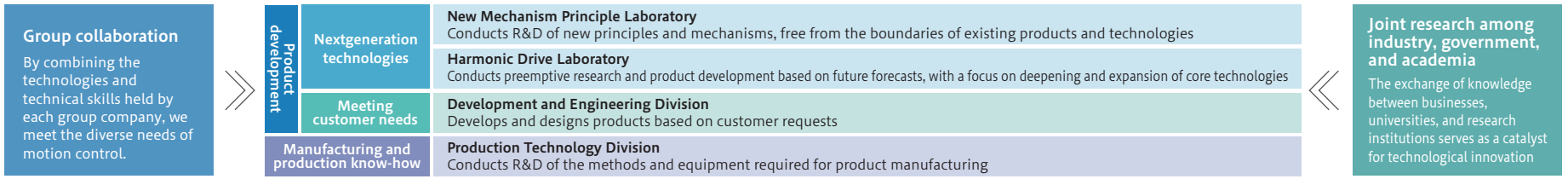
(4) Business operations integrating sales, manufacturing, and development

The strength of the HDS Group lies in the system in place to provide products that meet customer expectations by quickly reflecting customer needs and engineers’ ideas in manufacturing, which is made possible through the close collaborations among the sales, manufacturing, engineering, and development sections.

(5) Global business expansion

The HDS Group has operation sites in Japan, Europe, the U.S., South Korea, China, and Taiwan. Business strategies that conform to characteristics of each region are promoted and each site mutually cooperates to provide optimal products and services to customers around the world.

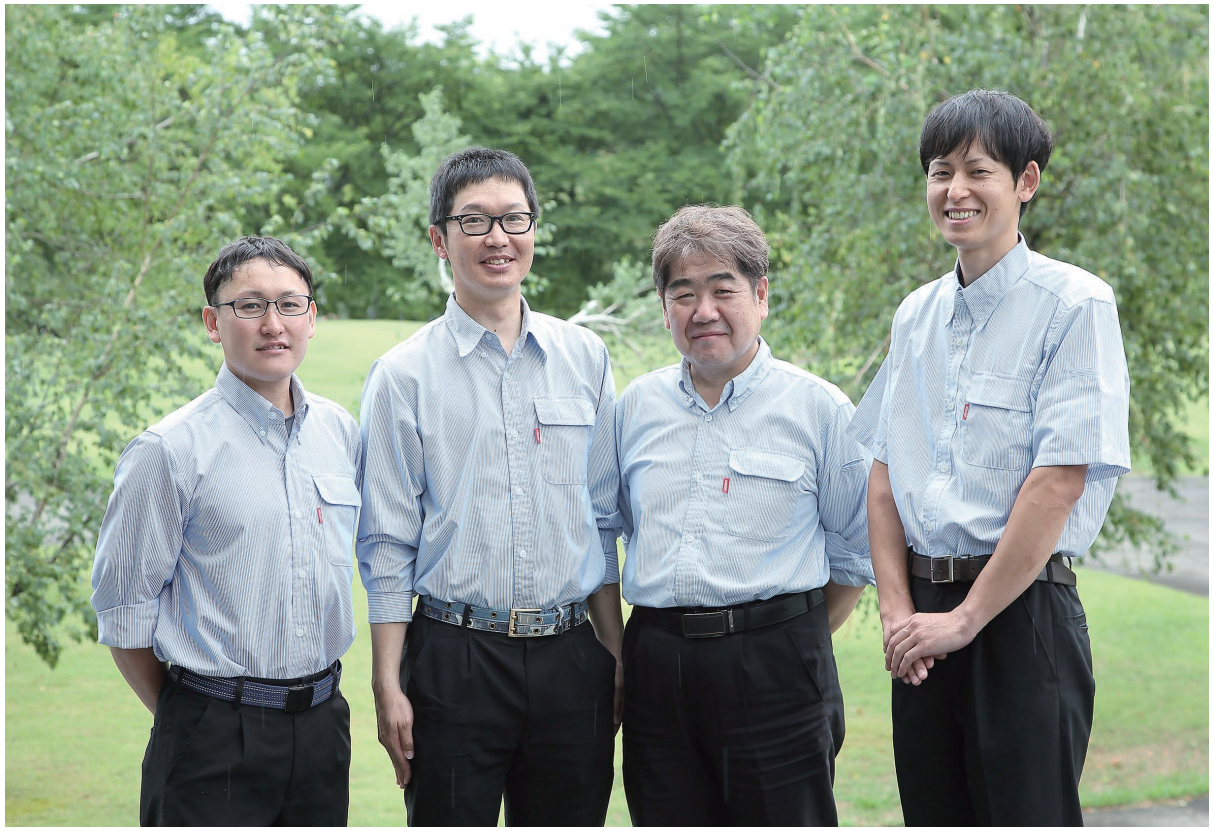
● R&D Organization



Special Feature

Employee Roundtable Discussion “Craftsmanship and quality as pillars of the HDS Group”

Four employees responsible for upholding the craftsmanship and quality that define the HDS Group discussed what makes our Group’s unique sensory testing difficult and important and the quality-focused testing framework.



Takeshi Hiraide
First Production Division
Unit Production Department
A-line Unit Assembly

Hidetaka Iwahara
First Production Division
HD Production Department
#1 (Mainline)
C/S Line Component Testing Leader

Yoshito Yamaguchi
Quality Assurance Division
Quality Control Department
Shipment Inspection at Hotaka Factory
Manager

Yusuke Takizawa
First Production Division
Unit Production Department
A-line Mini-unit Assembly Leader

Q.
Tell us about our techniques and capabilities that differentiate us and our competitors cannot mimic.

Yamaguchi: Sensory testing, which relies on human perception, is one of our unique processes that other companies cannot mimic. Because every product has a different shape, we need to use different jigs for testing each product. If the shape was fixed and standardized, we could manage this by spending more time. However, because our minimum lot size is one piece, automating the inspection is difficult because of time and cost constraints. Therefore, our highly stable machining and inspection capabilities serve as our unique differentiators. Because the process involves human intervention, variations are unavoidable. However, they can be adjusted through our proprietary know-how, which can be rightfully described as craftsmanship.

Iwahara: Sensory testing relies on human perceptions. Meeting the standard values would be sufficient, but because the inspection relies on fingertip sensitivity, differences in quality assessment can occur. This is our key proprietary technique, and to ensure consistent skill levels among inspectors, they need to acquire our proprietary in-house certificate. Only certified employees are allowed to perform sensory testing, and becoming certified takes more than six months. Furthermore, just like a driver’s license, the certificate must be renewed once every few years.

Takizawa: For performance testing, we mount the workpiece on the testing device and launch the device, and mounting the workpiece requires operator expertise. In particular, we need high precision for the process where the workpiece is carefully placed at the designated position and the wave generator is precisely fixed. This is because how tightly they are fastened affects the data obtained. Therefore, we often have to rely on humans skills to obtain accurate inspection data. HarmonicDrive® has a very simple structure, which is why differences in each individual workpiece remarkably affect the product performance. We conduct full inspection for customers who request it.

Special Feature: Employee Roundtable Discussion "Craftsmanship and quality as pillars of the HDS Group"

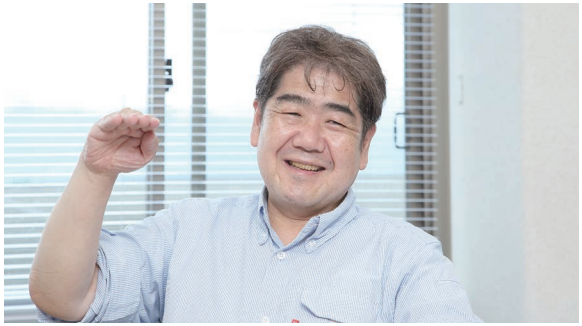
Hiraide: High-mix, low-volume assembly requires not only assembly experience but also thorough knowledge of customer needs and products themselves. In particular, when assembling the smallest model, it is important to thoroughly understand the product structure and applications. It also requires dexterity. Competitors' portfolios are focused on popular standard products, whereas we offer extensive product lines. Especially for the assembly of our smallest model used in applications, such as AI robot fingertips, we are confident that we maintain a technical lead of more than 10 years over our competitors.

Q. Could any of the techniques and skills be replaced with machines?

Hiraide: Robotization is an important means of automation. Robots can properly assemble products with simpler structures. At our company, we have successfully digitized the assembly processes by using robots for standard, general-purpose products. However, small, specialized high-mix, low-volume products, such as those used in AI robot finger joints, have complex structures and are produced in a limited volume. Therefore, in reality, automating the process would not be worth the cost. Assembling and inspecting these specialized products often require human perceptions, which are difficult to replace with machines.

Takizawa: For products with simple structures, the processes can be automated. However, automating processes for products with complex structures and numerous components would be more difficult. Currently, humans inspect such products. However, I believe that if AI and other technologies evolve, we will be able to automate the inspection process in the future. However, because some processes involve inserting components with complex shapes, it may take considerable time to fully digitize and automate them.

Yamaguchi: There is a dilemma in the inspection: even with automated measurement equipment, we still need setup time to operate it. Additionally, when inserting wave generators for high-end products, we use human operators in the assembly process because some customers find that manual assembly provides better precision. In using AI, it is humans who train and instruct it. We do not have clearly defined quality judgment criteria or equipment that can distinguish between scratches and dirt on product surfaces. Therefore, human involvement is essential. I believe that digitizing the processes (implementing AI) will take approximately 10 years.



Takizawa: Especially when assembling small and specialized speed reducers, the operators must be able to understand the product structures and shapes from assembly drawings and must have knowledge to explain them. This is because insufficient knowledge may lead to product nonconformance. Another challenge is that knowledge and experience from assembling one specialized product cannot be directly applied for another. To educate employees, we provide OFF-JT (group training), but mostly rely on OJT (on-site training). We also use distance learning to educate our personnel on materials science and other basic knowledge. Manufacturers that require this level of expertise and skills from their operators may be quite rare.

Q. Tell us about the training and succession of engineers and technicians.

Iwahara: Sensory testing could be more efficiently conducted with machines, but we currently rely on manual work. We are advancing successor training based on a five-level competency assessment. Mr. Yamaguchi's judgment is one of the criteria for our Group's sensory testing. Ideally, there should be a machine or clear criteria for consistent assessment, in reality; however, we rely on human tactile feedback, which is one of the factors making technical training and succession difficult. Gaining hands-on experience is the most effective way to advance our capabilities, which constitutes our unique training and succession approach.

Yamaguchi: Shipment inspection also requires an internal certification. If you complete at least one month of training and pass the exam, you can engage in shipment inspection work, but you will still need to attend training on an ongoing basis. In addition to shipment inspection, we also handle dimension measurement requests. On the basis of provided drawings and specifications, we need to think for ourselves about what to measure and how, which instruments to use and how to use them, and what kind of data can be obtained, among other things. We also need to determine if the data obtained are what the requestor wants, which requires communication skills for accurately identifying their requirements and intentions. If we do not sufficiently understand them, the measurement results would be useless. In our training program, we focus on developing these judgment skills and adaptability.

Takizawa: In training successors, we visualize operators’ skill sets for effective training and education. In the training process, rather than relying on conventional tacit knowledge, we provide guidance using up-to-date operation sheets that systematically document know-how. In particular, we emphasize learning from past mistakes. For example, for a case where a product was accidentally dropped, we clarify why it dropped and which operational methods were problematic and help them better understand the case through visual materials, such as photos and videos.

Q.
Tell us about your initiatives for maximizing output while maintaining high product quality.

Iwahara: To maximize output, it is crucial to build a production system that can flexibly adapt to changing demands. To that end, we believe that promoting multiskilling is effective. We are currently actively promoting multiskilling for sensory testing as well. Ideally, we hope that all team members will be able to perform sensory testing corresponding to different models. Currently, out of the 12 members of my section, three are certified for sensory testing. As more members become certified, I expect that our inspection coverage will expand, resulting in improved output.

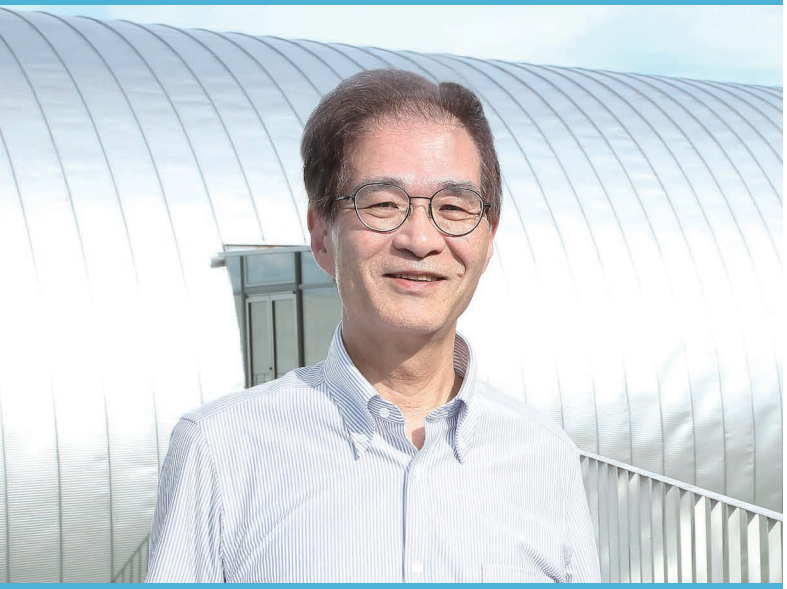
Yamaguchi: Inspection menus vary by product, and specialized inspections use various measurement instruments. Currently, testing is concentrated among certified inspectors. but as more staff become qualified, we will be able to maximize the output. Therefore, we have just introduced two additional instruments to further automate measurement work. Ideally, there should be a complete measurement manual, but in reality, we mostly rely on know-how, making steady training essential. This serves not only as an entry barrier but also as a bottleneck hindering performance optimization.

Takizawa: We are improving the production work environment, including improving operator workflow, reviewing production processes, and modifying processes for higher productivity. At the Hotaka Factory, which handles custom products, we are deploying automated assembly machines. Because the Hotaka Factory handles many customized products, machines often stop there. However, we aim to maximize the output by addressing issues and enhancing automation. Additionally, we are actively promoting multiskilling, because it is one of the key initiatives for enabling flexible work styles, including work style reform and encouraging employees to take paid leave and childcare leave.

Hiraide: To promote multiskilling, we are improving jigs and equipment, so anyone can easily use them. For some specialized products, we use jigs that are difficult to operate, which often makes multiskilling difficult. By solving each of these problems, we are currently building a system where anyone can easily assemble even specialized products. We believe that this will ultimately lead to maximized output.

Moderator: Thank you for your time today. I now understand the importance of your distinctive proprietary techniques and skills that are difficult to digitize. I also have realized that you maintain a lead of at least 10 years even as competitors emerge.

Message from the Officer in Charge of Development and Engineering



Director
Executive Officer
(In Charge of Development and Engineering)
Head of the Company Wide
Cost Innovation Project
Yoshihiro Tanioka

New product : AC servo driver HA-900A series
Releasing a new AC servo driver that maximizes actuator performance through innovative control technology

With the launch of the new product HA900 as a starting point, we will pioneer next-generation motion control for the HDS Group by reinforcing our technological foundations, expanding markets, and implementing IP strategies.

Launching the long-awaited HA900

The HDS Group has been actively offering total motion control through integrated in-house development and manufacturing covering motors, drivers, and control technologies. This approach is represented by HA900, a new driver released in October 2024. As a successor to the HA800 model, HA900 solves issues like vibration and noise through further advanced control technology while maintaining the compatibility of its predecessor. When we exhibited the new model at caravan events, it was positively received by our customers, and demand to switch from the old model is steadily increasing. Going forward, the key will be developing applications that maximize the performance of our HarmonicDrive® strain wave gears. At the International Symposium 2025 held in October this year, I gave a presentation on the evolution of control software as the development team representative.

Reinforcing the research and development foundation that supports technological capabilities and reliability

Creating new value requires enhancing product capabilities and improving theoretical validation and reliability to support them. Our Company utilizes FEM (Finite Element Method) analysis to scientifically understand the structural behavior and stress distribution of strain wave gears. Based on these insights, we pursue rational and safe designs to propose optimal specifications tailored to each customer's applications. Specifically, we are currently working with a grease manufacturer to develop new types of grease while developing oil seals that effectively prevent grease leakages in unit structures to further enhance the reliability of HarmonicDrive®. We will continue to strengthen our collaboration with Harmonic Drive Laboratory and further accelerate our initiatives to balance quality and reliability.

Penetrating markets and expanding into new fields through customized solutions

Our Group's strength is the ability to flexibly tailor our solutions to different customer needs. Beyond traditional industrial robotics, we provide products for various fields, including automotive applications and other mass-production projects, as well as space and next-generation mobility. For example, we are steadily making progress in integrating state-of-the-art technologies, including the lunar rover project with Toyota Motor Corporation and flying cars that were demonstrated at the Osaka-Kansai Expo. Furthermore, we are accelerating our expansion into AI-enabled robotics, which requires light weight and high performance, allowing our Group to demonstrate a competitive advantage. On the development front, we are reviewing the balance between cost and performance when conducting destructive strength evaluations and verifying relaxed tolerances to adopt lower-cost materials. Through these initiatives, we aim to balance cost competitiveness and performance by transforming our design approach, rather than focusing only on high performance.

Shaping the future by expanding the production lineup and implementing IP strategies

We will promote the full-scale launch of the light-weight and high-precision ULW series while modularizing the designs and evaluations. By revising the model number system, we will expand the product lineup based on uniform standards while streamlining designs and accelerating commercialization. On the defensive side, we have established a system that ensures technical accountability to customers by scientifically understanding how failures occur through FEM analysis and other means and reinforcing designs based on theory. Regarding patent strategies, based on lessons learned, we will actively patent our machining technologies and other know-how to further strengthen our competitive differentiation. Moreover, in the medium term, we will develop markets for next-generation mechatronics products, including intelligent actuators, while accelerating the evolution of HarmonicDrive®.

Message from the Officer in Charge of the Laboratory

Executive Officer
Head of Harmonic Drive Laboratory
Shizuka Yata

While staying true to our research culture “Don’t fear failure; just try first,” we will evolve into a laboratory that pursues offensive business strategies for financial and nonfinancial contributions.

Providing technological support for the new alliance-enabled project

As the Group’s core technological function, the Harmonic Drive Laboratory is committed to creating new value through close collaboration with internal and external parties. We are currently advancing a joint development project for small robot hands with a business partner. By leveraging our compact HarmonicDrive®, which features high torque density, we are exploring new possibilities in the robot solution field. Additionally, we plan to exhibit at CES 2026, one of the world’s largest technology exhibitions, which will take place in the U.S. in January 2026. In this way, we are committed to envisioning the future based on more reliable technology while engaging in repeated technological discussions with domestic and international companies, research institutes, and universities; continuously proposing solutions to the market and receiving feedback.

Seeking to transform into a laboratory that pursues offensive business strategies

The laboratory’s mission is to advance fundamental technology and maintain and strengthen our position as the top company in strain wave gear technology. For example, as the leader in this field, we take pride in our dedication to continuously obtaining component test data and conducting analysis to meet expectations for reliable test data and interpretations in the aerospace domain. Meanwhile, we emphasize the importance of learning through taking on challenges. In recent years, we have been working to develop compact HarmonicDrive® for physical AI requiring compactness and light weight. One engineer reflected, “I had been so afraid of failure that I forgot to take on challenges.” This prompted us in the laboratory to renew our commitment to the spirit of “let’s just try it.” We even start external collaborations by encouraging a “try first” mindset.

Providing technological support and ensuring quality to drive financial performance

For financial contribution, we conducted technical assessments of parts and materials procured from Chinese manufacturers through the Company-wide Cost Innovation Project Subcommittee. We collected and analyzed experiment data from both reliability and cost perspectives and compiled our findings based on the results. Additionally, through persistent technological support, some customers have come to understand our products and adopted them in their new offerings. The laboratory’s core value lies in its technological credibility based on quantitative lifespan assessments and reliability. We currently have eight members working in two teams: numerical analysis and experimentation. Our initiatives, which combine analytical and execution capabilities, have directly led to enhanced product reliability and financial impact.

Establishing a sustainable technological foundation and addressing material issues

On the nonfinancial front, the laboratory strongly supports the innovation of the HDS Group. In addition to maintaining and improving quality, building a culture that tolerates taking on challenges and failing for innovation is crucial, as it directly relates to our material issues. In addition to accumulating expertise on lubrication, tribology, and other technologies, we will build testing environments, including vacuum chambers for space applications and clean rooms. By doing this, we will establish an agile system that will allow us to promptly respond to external and internal development requests. This will enable us to make proactive proposals aiming to create new markets. Our laboratory will work with domestic and international networks and continue to steadily create future technological value as the stronghold of technology supporting the HDS Group’s future.

Message from the Officer in Charge of Sales

Director
Executive Officer
(In Charge of Marketing and Sales)
General Manager of Domestic Sales Division
Naomi Shirasawa

The price revision has provided an opportunity to further strengthen customer trust. We will think flexibly and implement proactive business strategies to transform changes in the business environment into a driving force.

We need to think flexibly and change our perspective.

As the industrial structure and economic cycle transform, we emphasize the importance of carefully observing and understanding customer behaviors while working together to identify and respond to changes in society and the market. Beyond our group's traditional strengths in precision and stiffness, we must now address new elements, such as flexibility and optimization. These involve redesigning products and changing materials by leveraging the rapidly advancing integration with AI and software. Even if products themselves remain unchanged, the required performance and characteristics continue to change, requiring us to strategically transform ourselves, including honing our technologies and even downgrading specifications, which used to be unthinkable. I believe that the sales team needs to understand the changes and develop flexible thinking to propose optimal solutions that balance technology and customer needs.

We have succeeded in updating prices for the first time in 15 years while building customer trust.

In October 2024, we revised product prices for the first time in 15 years. The revision was driven by factors, such as rising material prices and labor costs. Rather than simply changing prices, we directly spoke with all customers to sincerely explain the situation, thereby gaining their understanding on our improved product quality and delivery flexibility, among other capabilities. I feel that this has enabled us to reinforce our customer relationships, achieving results that go beyond gains from price revision. We are currently reviewing our relationships with our dealers and optimizing our distribution network. We engaged in price negotiations to establish mutually beneficial relationships based on trust and repeated discussions, rather than settling for temporary measures.

We are also seeking to enhance our field capabilities and agility.

With digital transformation (DX) of sales now in full swing, we are using Salesforce, our sales support system, to integrate data, prepare weekly sales activity reports, and automate processes, such as quotation generation. These advances in digitization have enabled us to visualize our business activities, leading to improved quality in sales operations. Simultaneously, through group training for mid-level employees and continuous training for younger personnel, we are developing next-generation management talent and enhancing the technological expertise and execution skills of sales team members. By doing this, we are building an organizational system that allows us to flexibly adapt to changes. We are seeing more male employees taking childcare leave, and a corporate culture supporting flexible work styles is spreading. By reinforcing field capabilities like this, we are enhancing our ability to serve our customers, leading to a strengthened foundation for competitiveness.

For growing markets, we will implement proactive business strategies.

With the rapid growth of the AI sector, including semiconductors and robotics, as well as the emergence of next-generation mobility, we are increasingly hopeful that we will expand into new markets and applications in the medium to long term. In the robotics field, we participate in our customers' development projects. In the semiconductor manufacturing equipment field, we aim to increase the adoption rate in next-generation equipment by engaging with 10 major customers in their projects, starting from the development phase. Meanwhile, regarding overseas operations, we ensure close collaboration among the four hubs (Japan, the U.S., Germany, and China) through global conferences and online meetings to share information on competitive landscape and market opportunities. Regarding the promising physical AI field, we are reinforcing our flexible sales structure to swiftly respond wherever markets may emerge. We will enhance our global competitive advantage by leveraging our custom solution capabilities.

Message from the Officer in Charge of Corporate Planning

Executive Officer
General Manager of Corporate Planning
and Head of Business Development
Tetsuya Shiokawa

We will break away from passive management and integrate the organization by strengthening proactive growth strategies and global collaboration. By doing so, we will promote transformations for global success.

We will shift from the product-out approach and rebuild our growth strategies.

I feel that our group has been underestimating the importance of growth strategies as we have been taking a product-out management approach due to our strong product competitiveness. Previously, while we were simply waiting, our customers invited us to join their projects or asked us to manufacture products for them, allowing us to sustain our business through a passive approach. In recent years, however, due to changes in the demand landscape and the emergence of competitors, we have been urged to break away from our traditional passive management style and start proactively proposing through growth strategies. In fact, we are currently implementing proactive physical AI strategies, and the employee mindset is starting to change. The Corporate Planning Division would like to promote our group's transformation by spearheading aggressive strategies and foundational work to stay ahead of our competitors.

We will implement proactive differentiation strategies with a sense of urgency.

For physical AI, some of our group's customers have begun mass production, and we have ongoing prototyping projects with multiple companies. However, in our existing business domains, we are concerned that one day, relying only on our current stand-alone offerings may not be sufficient to sustain our business, and alternative products may emerge. Therefore, it is essential to actively establish frameworks for co-creating with our customers and building unwavering trust. Beyond stand-alone speed reducers, we will expand into the module and actuator field to differentiate ourselves from our competitors to ensure that we will achieve the provision of total motion control as our business domain. We will turn the sense of urgency into our driving force, and we will progressively build a robust organizational structure.

While improving our strengths, we also need to question our traditional assumptions.

Our group's strengths lie in our superior brand recognition and quality, as well as our production capacity and our enhanced capability to ensure on-time delivery. We have established four production hubs in four locations: Japan, Europe, the U.S., and Korea, which allows us to flexibly adapt to geopolitical risks and changes in geographic demands while maintaining sufficient supply capacity. Our shareholders and investors often ask us if we can produce locally in China, so this will need to be discussed because the technological level of the local manufacturers of materials and bearings has been improving. First, we will steadily promote our ongoing collaborations with Chinese local partners and will adopt locally produced materials as part of the company-wide cost innovation project to enhance our profitability.

By enhancing global collaborations, we will integrate our strategies.

Within our group, our international subsidiaries have been autonomously managing their business in their respective markets. However, our global presence as a group has not been strong enough. Therefore, in 2024, we launched our first strategic conference that convened the leaders from our three hubs: Japan, Europe, and the U.S. I attended the global sales & marketing meeting held in June, where we exchanged views on when and where mega corporations globally distributing AI robots will produce their products, how much they will produce, how we will respond, and other relevant matters. In July, the global quality assurance meeting took place, and in October, the production engineering team held the global engineering meeting. Through these global meetings, we will further integrate group strategies to enhance our ability to adapt to changing demands and serve global customers.

Message from the CEO of Harmonic Drive SE (Germany)

We will pursue our strategic focus by expanding in Aviation & Space and Artificial Intelligence (AI)-enabled robotics, deepening our innovation pipeline, enhancing our digital infrastructure, and providing our customers with tailored, flexible solutions.

Harmonic Drive SE
Chief Executive Officer
Thomas Berger

My mission as CEO and global strategy

For more than 20 years, I have worked in various management roles as part of the Harmonic Drive Group. Since 2022, I have been the CEO of Harmonic Drive SE (HDSE). I am proud to have been able to position the company to achieve further growth with the help of our business strategy. I believe it will help increase overall profits if we further expand collaboration between Harmonic Drive companies, particularly regarding customers, products, and brand. It is my mission to ensure that this approach is reflected and put into practice in future action plans. We are dedicated to achieving sustainable growth and shaping the future of HDSE and the Harmonic Drive Group through precision, innovation, and resilience.

Expanding in the Aviation & Space sector and addressing industrial challenges

One of our priority areas in 2025 is the Aviation & Space sector. Harmonic Drive's high-precision, lightweight, and compact drive technologies are ideally suited for Aviation & Space applications where safety, reliability, and performance are nonnegotiable. We have initiated several co-development projects with key players in the aerospace ecosystem while continuing to deepen existing partnerships. We also intensified our prototyping business to accelerate the time-to-market of tailored solutions for new Aviation & Space platforms. Through these efforts, we have established a framework that enables us to flexibly serve customers with smaller volumes or highly individualized requirements, leveraging our strategic strengths to set us apart from the competition.

Driving innovation through robotics and digitalization

Technology development for AI-enabled robots, including humanoid robots, is at the core of our innovation strategy. HarmonicDrive® components are integral to next-generation humanoid systems. Our technologies are opening up transformative applications in medical technology, logistics, and personal assistance by enabling more natural motion and higher energy efficiency. In parallel, we have further strengthened our focus on smart manufacturing by integrating intelligent systems and data-driven processes across production. This allows us to work more efficiently, quickly adapt to changing customer needs, and enhance product quality. Furthermore, we expanded our social media channels and strengthened our online presence through a complete website relaunch, targeted campaigns, people-centric content, and significantly increased output, fostering dialogue with customers, partners, and future employees. We participated in significantly more trade fairs than in previous years, using these opportunities to showcase innovations and connect with customers.

Solidifying the growth platform with sustainability and human resources strategies

We remain committed to environmental responsibility and social engagement as part of our efforts to maximize corporate value. In 2025, we continue to implement energy-saving measures by reducing CO_2 emissions from our operations, expanding our electric vehicle fleet, and introducing smart LED lighting systems, thereby improving sustainability and cost-effectiveness. Regarding our human resources strategy, we welcomed Christian Reuter to our Management Board, strengthening leadership and reinforcing our team-first philosophy. As an attractive and forward-thinking employer, we invest in our employees and create an environment in which talent can grow and thrive. Furthermore, we are considering bringing our three major production locations around the world (Japan, Germany, and the U.S.) together under a shared brand identity. As we move toward 2027, we will pursue our strategic focus by expanding in Aviation & Space and AI-enabled robotics, expanding our digital infrastructure, supporting our customers with tailored, flexible solutions, promoting sustainability, and continuing to build a strong team.

Message from the President & CEO of Harmonic Drive LLC (USA)

Our strategy has been to advance the development and delivery of solutions with a unique value proposition, such as lightweight and compact integrated actuators, to ensure faster growth than the overall motion control market.

Harmonic Drive LLC
President and CEO
Douglas Olson

Prompt responses to tariff turbulence and our strategy in the U.S. market

In 2025, the market environment has remained highly volatile and unpredictable as the U.S. government has imposed a series of tariffs and repeatedly revised rates. Our response has been to reinforce our long-term strategy of manufacturing close to our customer base. Currently, 75% of the products we sell in the US are manufactured in our factory in Massachusetts. This differentiates us from competitors who only have a sales presence in the U.S. and import all their products. Our strategy minimizes tariff surcharges that we pass along and has strengthened relationships with our customers as they recognize the benefits of working with a U.S. manufacturer.

Focus on our Medium-Term Management Plan and markets with high growth potential

Our Medium-Term Management Plan centers around five strategic goals, with a focus on markets that are forecasted to have strong growth. These include applications for semiconductor capital equipment, medical equipment including surgical robots, and humanoid and other AI-enabled robots. We are strategically allocating resources to the fields projected to see future demand expansion. These markets are expected to grow at an accelerated pace over the coming decade with the development of AI technologies. Accordingly, we are making up-front investments to establish our competitive advantage in the market. Our strategy to provide the industry's best value in terms of quality, cost, delivery, and service enables us to earn a premium price for our products. Customers' purchasing decisions are often based on value, not price. Our high-quality products and services continue to attract new business opportunities.

Technological innovation and differentiation in aerospace

To meet growing market needs, we are pursuing the development of integrated actuators and other new products. Our U.S. development team has created nine integrated actuators featuring the CANopen® interface. Building on this success, we released four new integrated actuators which use the EtherCAT® interface in the third quarter (July–September) of 2025. The benefits to our customers are greatly simplified wiring, space savings, and ease of commissioning. As the first company in the world to have certified integrated actuators, we are strengthening our competitive position in the market. Harmonic Drive LLC has manufactured more than 10,000 gears that have been launched into space. We provide our aerospace customers with lightweight, highly reliable solutions that leverage our strain wave gear technology. We have built sustainable competitive advantages in the rapidly growing aerospace market by establishing unique differentiating factors and delivering high-value-added products.

Initiatives for sustainability and social responsibility

Harmonic Drive strives to reduce environmental impact and contribute to the betterment of society. Our factory operates a building management system that minimizes energy consumption by using high-efficiency lighting, HVAC, and compressors. Simultaneously, a solar installation of more than 1,200 panels has been completed, which is expected to generate 720,000 kWh of energy per year, equivalent to a reduction of 484 metric tons of CO_2. As part of our contribution to local communities, we promote initiatives to fulfill our social responsibilities through employee volunteering and charitable donations, including continued support for St. Jude Children's Research Hospital. Fulfilling corporate social responsibilities is fundamental to enhancing our employees' pride and motivation and supporting our company's sustainable growth.