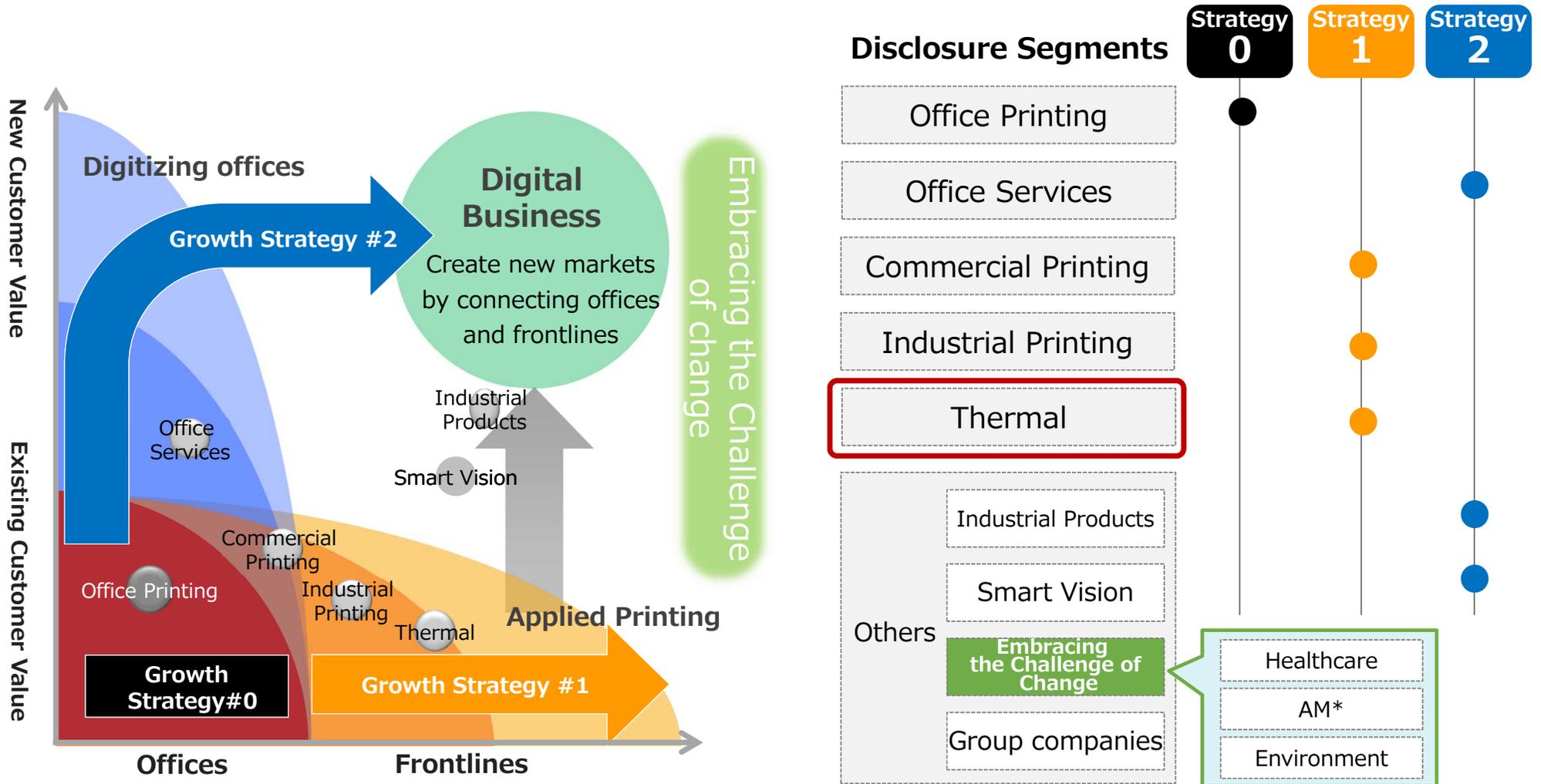


**Thermal
Business**

April 11, 2019

**Keiichi Shiokawa
General Manager of
IMS Business Group
Ricoh Company, Ltd.**

Growth Strategy "RICOH Ignite"

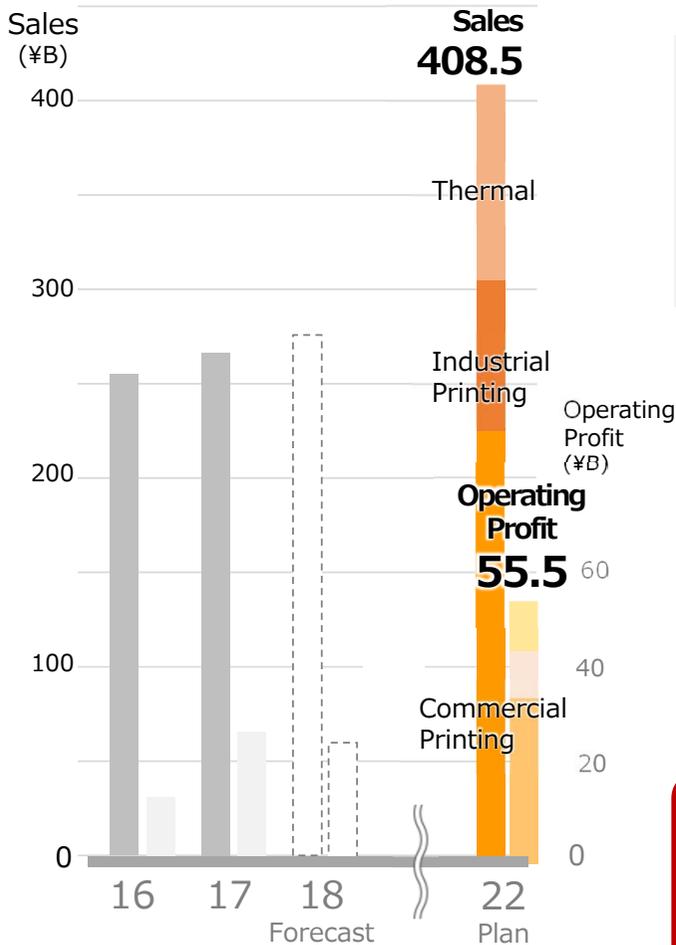


*AM: Additive Manufacturing

Toward FY2022

Growth Strategy
#1

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Growth Strategy #1 toward FY2022

Expand Commercial Printing business earnings and invest heavily to drive Industrial Printing business growth

Commercial Printing: Bolster solutions to cater to various market needs in core, enterprise, commercial, and other printing areas, supporting customers and printing businesses and growing with customers

Industrial Printing: Expand our customer value proposition and reduce environmental impact by materializing our digital micro factory concept, opening up new vistas for industrial printing "

Thermal: Leverage competitive edge in existing businesses to maximize earnings while launching new operations to expand our business and increase the operating margin to more than 10%

Thermal Business Overview (Products)

Thermal Business

Offering media products and systems that print barcodes and other variable information to identify individual items for retailing, logistics, and manufacturing

Thermal paper

Thermal labels for outputting variable information color on scale and barcode printers

Main applications



Food portion labels



Shipping labels



Medical wristbands



Lottery and other tickets

Thermal Transfer ribbons

Barcode printer ink ribbons that print variable information on paper and film

Main applications



Process control labels



Clothing care labels



Product control labels



Date stamps

Laser solutions

Rewritable laser system

Can repeatedly print and erase variable information

Main applications



Returnable box



Inter-plant transport tray



Medicine delivery tray in hospital

Fast laser printing system

An on-demand setup for printing at up to 5 meters a second

Main applications

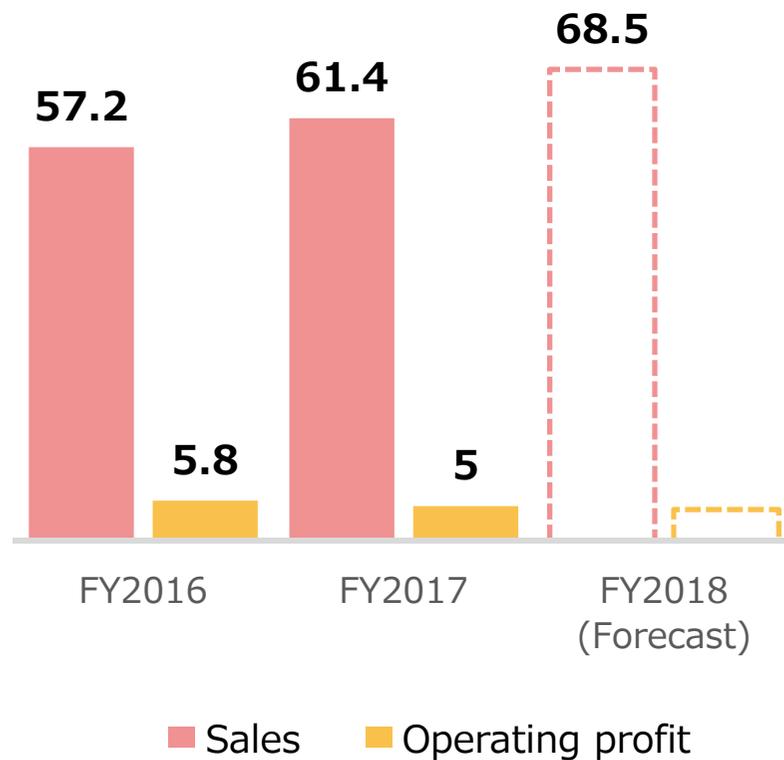


Customized labels for plastic beverage bottles (printing speeds of 3 to 5 meters per second)

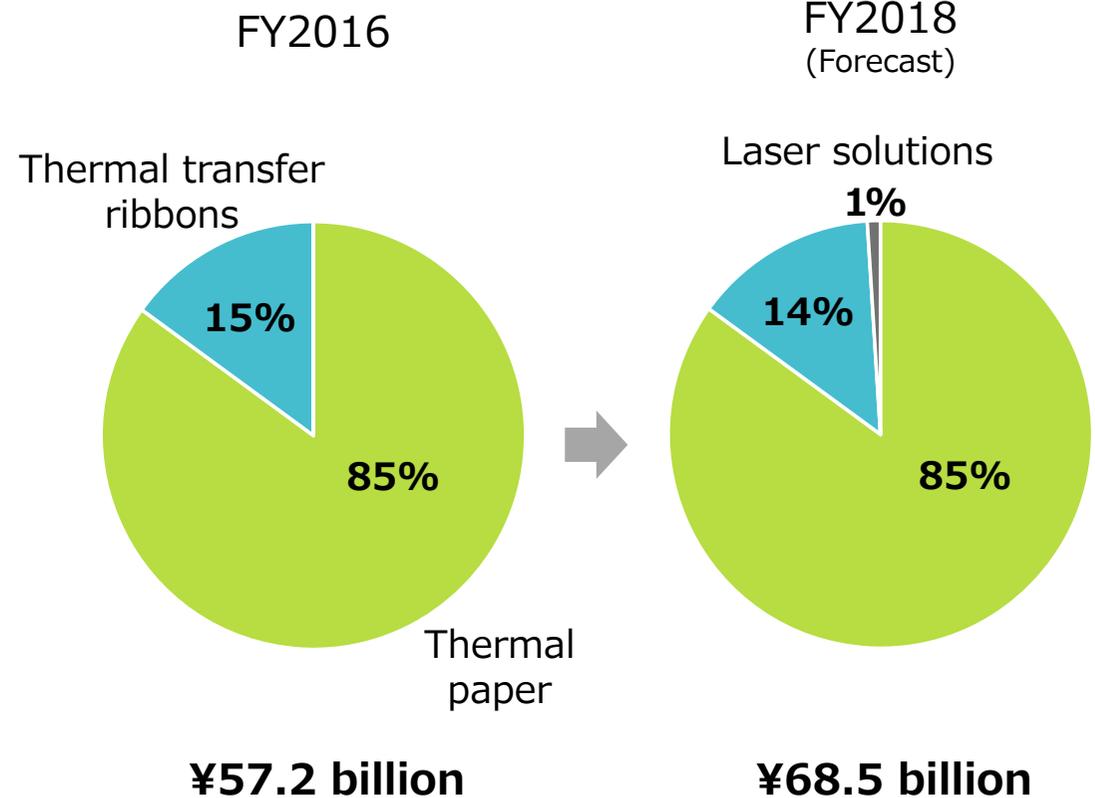
Thermal Business Overview (Results)

Results

(Billions of yen)

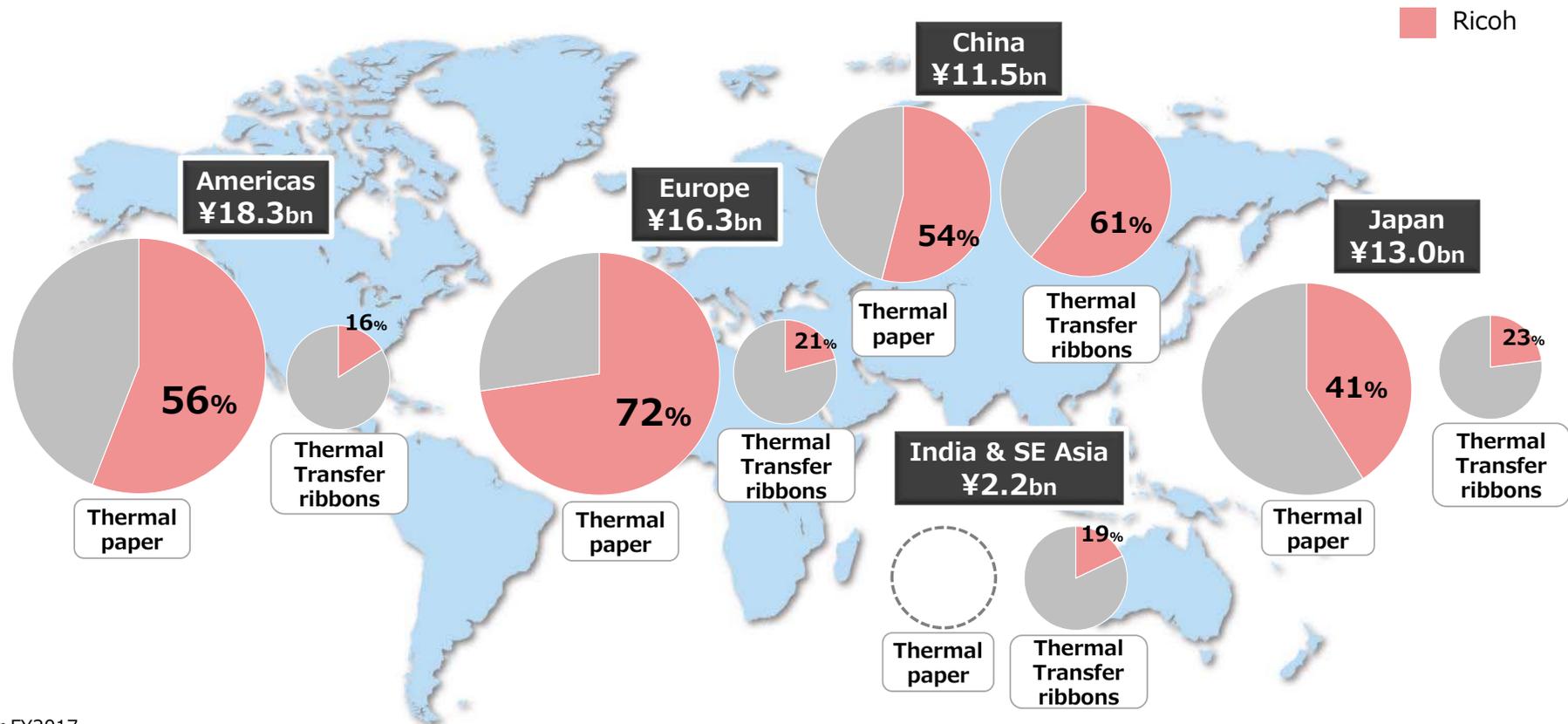


Sales composition ratios by business



Market Share

Ricoh gains 50% share in global thermal paper market, and 30% in thermal transfer ribbons. The key thermal paper markets are the Americas, Europe, China, and Japan. The prime thermal transfer ribbon markets are China, India, and ASEAN.



Note: Results for FY2017

Thermal paper: Market share based on Ricoh survey, excluding for point-of-sale cash registers and fax applications.

Transfer ribbons: Based on Ricoh survey, excluding wax grade ribbons.

Thermal Paper



Market trends	Core customers	Ricoh's strengths	Initiatives and results
<ul style="list-style-type: none"> ● Global thermal paper market forecast: CAGR7% ● e-commerce market expansion is boosting demand for shipping labels ● Food scale labels increasingly incorporate nutritional and allergy information 	<ul style="list-style-type: none"> ● Logistics players and online sellers with logistics function ● Supermarkets and other retailers 	<ul style="list-style-type: none"> ● Production and supply capability apply to demand growth <ul style="list-style-type: none"> – North America: Doubled adhesive coating capacity in 2017 – China: Doubled thermal paper production capacity in 2018 – Europe: Looking to double thermal paper production capacity by 2020 	<ul style="list-style-type: none"> ● Developed high-resolution products with high heat resistance and built the thermal label market ● Set up full-fledged planning, development, production, and sales units in key Japanese, American, European, and Chinese markets ● Maintained 50% share of global market and boosted sales by around 1.5 times in past five years

Key business strategy	Measures	KPI	Results stance
<ul style="list-style-type: none"> ● Expand operations in key Japanese, American, European, and Chinese food and e-commerce markets 	<ul style="list-style-type: none"> ● Drove business growth by reinforcing production structure in response to demand in food and e-commerce markets <ul style="list-style-type: none"> – North America: Boosted adhesive coating capacity in 2017 – China: Increased thermal paper production capacity in 2018 – Europe: Increase thermal paper production capacity in 2020 	<p>Sales ¥71.3 billion (FY2022)</p>	<ul style="list-style-type: none"> ● Expand earnings from sales gains in target segments <ul style="list-style-type: none"> – Growth rate: 23% (compared with FY2018)

Products and Technologies : Thermal Paper

Innovation

High resolution

Rising ubiquity of two-dimensional codes and character information volume necessitate printing of **high-definition images and text**

Ricoh product



Rival product



High heat resistance

50 seconds at 1,900 watts in microwave oven

Images impervious to heat, abrasion, and other usage environment stresses

Ricoh product



Rival product



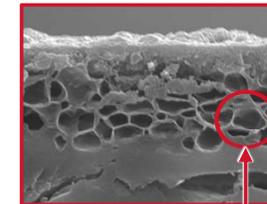
Ricoh's advantages

Balloon structure and cushioned base ensure high thermal head adhesion and **high-resolution printing**

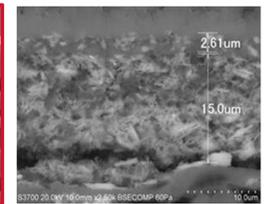
Hollow filler ensures high thermal insulation and retains print energy to maintain **high thermal resistance and sensitivity**

Cross-section of thermal paper

Ricoh product



Rival product



Balloon-structured filler is 90% air

Hollow filler for high print energy efficiency

Thermal Transfer Ribbons



Market trends	Core customers	Ricoh's strengths	Initiatives and results
<ul style="list-style-type: none"> Transfer ribbon markets in target areas forecast: CAGR9% Expanding demand from production bases in emerging countries 	<ul style="list-style-type: none"> Manufacturers Logistics firms 	<ul style="list-style-type: none"> Sales and production sites in India, Indonesia, Thailand, and Vietnam to cater to demand growth 	<ul style="list-style-type: none"> Developing products that combine diverse paper types with high resolution and thermal and solvent resistance Have boosted sales in India and Southeast Asia 80% over the past five years



Key business strategy	Measures	KPI	Results stance
<ul style="list-style-type: none"> Expand in emerging nations (India and ASEAN countries) 	<ul style="list-style-type: none"> Expand business by increasing market shares in India, Indonesia, Thailand, and Vietnam, which are experiencing exceptional industrial production growth 	<p>Sales ¥12.2 billion (FY2022)</p>	<ul style="list-style-type: none"> Expand business from sales gains in target country markets <ul style="list-style-type: none"> Growth rate: 18% (compared with FY2018)

Products and Technologies : Thermal Transfer Ribbons

Innovation

High resolution

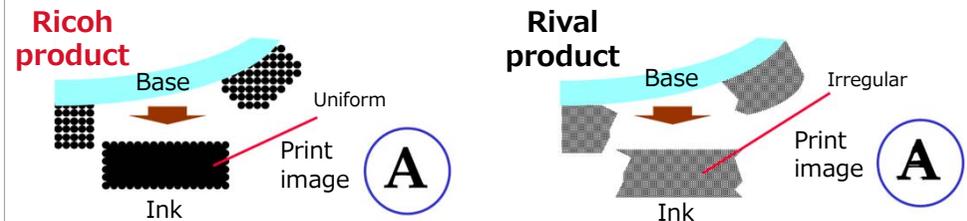
Rising ubiquity of two-dimensional codes and character information volume necessitate printing of **high-definition images and text**

Paper compatibility

Can print on various paper types according to applications

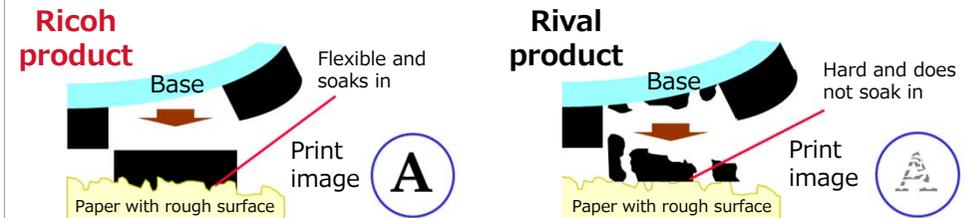
Ricoh's advantages

High resolution



- The ink layers of rival offerings have no gaps, making it hard to work out where breaks should be
- Ricoh offerings offer sharp gaps between particles, for high resolution

Paper compatibility



- Rival offerings have smaller adhesion areas on rough paper, impeding ink fixing
- Ricoh's offerings can print on everything from rough paper to smooth film

Laser Solutions



Market trends	Core customers	Ricoh's strengths	Initiatives and results
<ul style="list-style-type: none"> ● Increasing personalization demand (one-to-one marketing) ● More food allergen and other mandatory information being listed on labeling owing to amendments in laws ● More real-time sales promotion and mass customization 	<ul style="list-style-type: none"> ● Food and commodity brand owners 	<ul style="list-style-type: none"> ● Fast (5 meters per second) printing solutions with laser printing units and specialized imaging media 	<ul style="list-style-type: none"> ● Developed new solutions by combining high output laser and color development technologies ● Cultivated brand owners by partnering equipment and packaging machinery manufacturers ● Prototype completion



Key business strategy	Measures	KPI	Results stance
<ul style="list-style-type: none"> ● Contribute to business by creating customer value with laser solutions 	<ul style="list-style-type: none"> ● Swiftly create and expand market globally by partnering with existing players (equipment manufacturers and print converters) 	<p>Sales ¥20.0 billion (FY2022)</p>	<ul style="list-style-type: none"> ● Expand operations through new businesses – Growth rate: ∞

FY2022 Goals

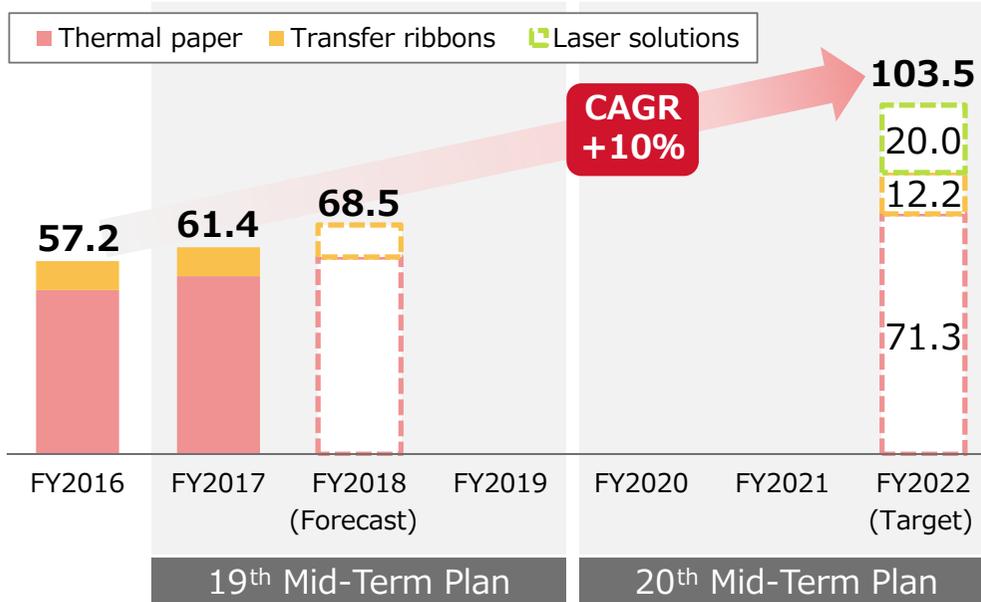
FY2022 Targets

Sales **¥103.5 billion**
Operating profit **¥10.5 billion**

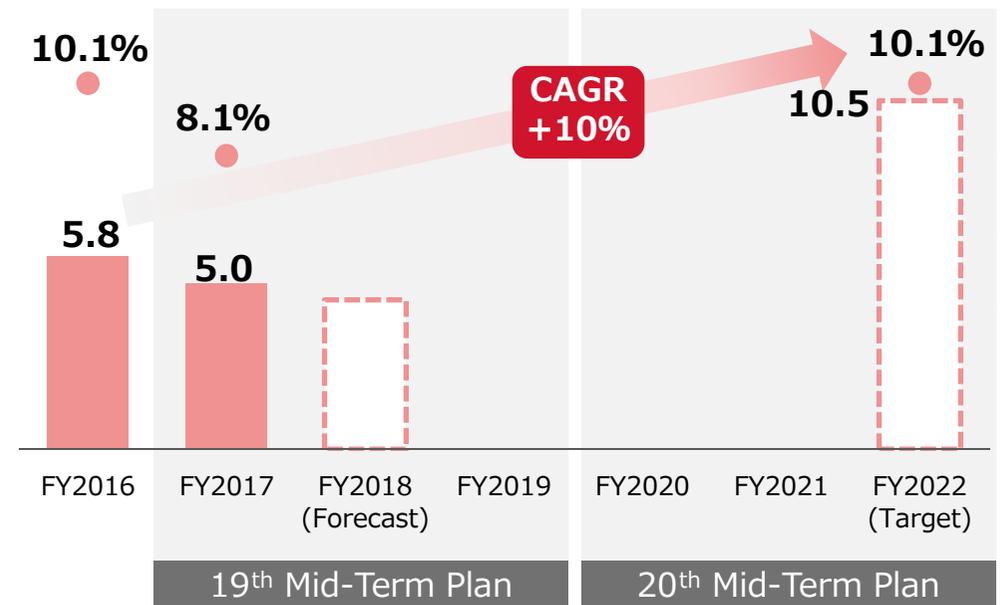
<Key strategy>

- Leverage superior competitive position to optimize earnings while launching new businesses to expand and generate an operating margin exceeding 10%

Sales (billions of yen)



Operating profit (billions of yen) / Operating margin



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Forward-Looking Statements

The plans, prospects, strategies and other statements, except for the historical events, mentioned in this material are forward-looking statements with respect to future events and business results. Those statements were made based on the judgment of Ricoh's Directors from the information that is now obtainable. Actual results may differ materially from those projected or implied in such forward-looking statements and from any historical trends. Please refrain from judging only from these forward-looking statements with respect to future events and business results. The following important factors, without limiting the generality of the foregoing, could affect future results and could cause those results to differ materially from those expressed in the forward-looking statements:

- a. General economic conditions and business trend
- b. Exchange rates and their fluctuations
- c. Rapid technological innovation
- d. Uncertainty as to Ricoh's ability to continue to design, develop, produce and market products and services that achieve market acceptance in hot competitive market

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**Note: In this document, fiscal years are defined as follows:
FY2018 = Fiscal year ended March 31, 2019, etc.**