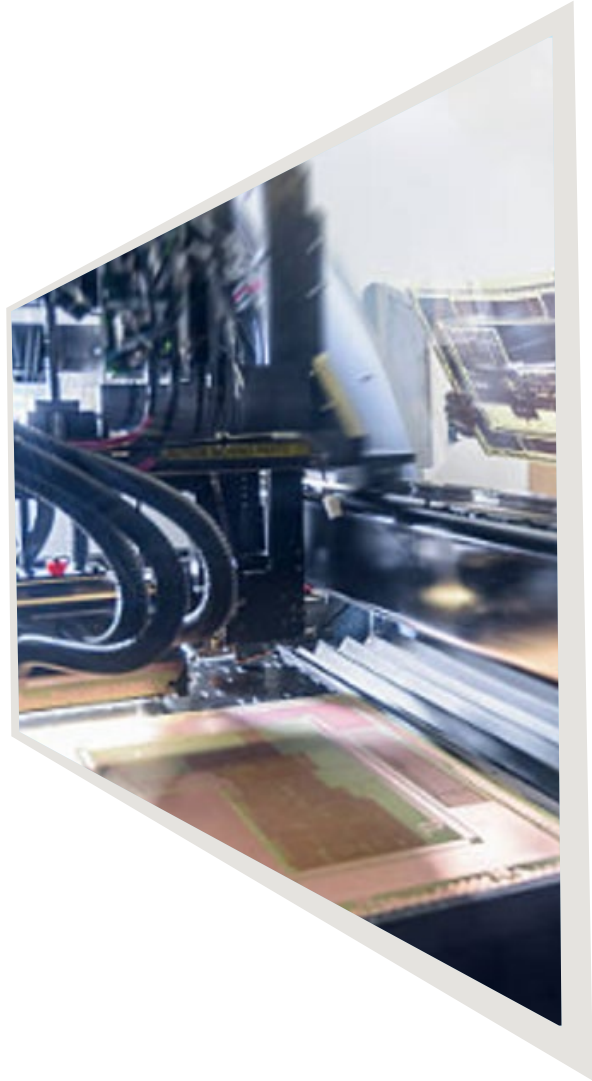
IJ Component Business

Toward Solving Material Issues



15,May,2023

Seiji Nakashima

Deputy General Manager of IJ Component Business Unit

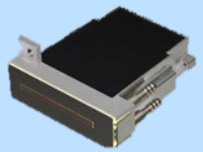
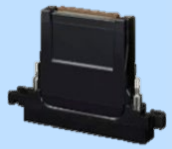
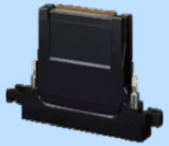
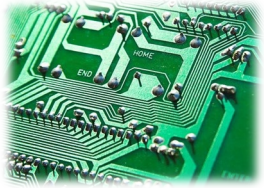
KONICA MINOLTA 150 YEARS

Giving Transformation to the customers' manufacturing workflow by INKJET

Contribute to solve Customers' and Social challenging by INKJET technology

- Simplified process
- Better work environment
- Resolve manpower shortage
- Downtime reduction
- Material loss reduction
- VOC, CO_2 reduction
- Industrial wastewater reduction

About the IJ Components Business

Konica Minolta products	End customers and products	Applications
 KM512 series  KM1024 series	**Large-format printers**  Printer manufacturers in ASIA, Europe, and U.S. Hundreds customers	 Sign Graphics
 KM1024i series  KM1800i module	**POD (print on demand)**  AccurioJet KM-1 Major printer manufacturers Score of customers	 Commercial Printing  Soft packaging and Packages
 KM1800i SHC-C   KM1024a/i series with additional features Water-based ink Functional Ink Special Indsutrial chemicals	**Pattern generation in manufacturing processes**  Major manufacturing equipment manufactures Score of customers	 Printed Circuit Boards  Displays

Origins of the IJ Components Business

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Nassenger V

Nassenger PRO 60

Launched Inkjet Textile Printer "NASSENGER"

Industrial Print Business

AccurioJet KM-1

Commercial printing

Textiles

NASSENGER SP-1

NASSENGER 10

1995 2000

2017
Spun off as the Components Business

Started IJ head Development

KM512 series

Started Sales of IJ heads

KM1800i SHC-C

2018

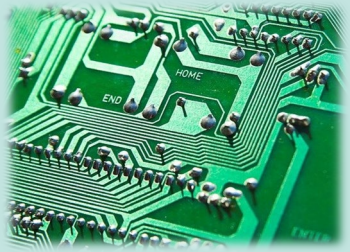
Acquired thin film MEMS technology from Panasonic

Shift to on-demand manufacturing

Sign Graphics

Construction Materials

High-performance inks based on unique chemical technology



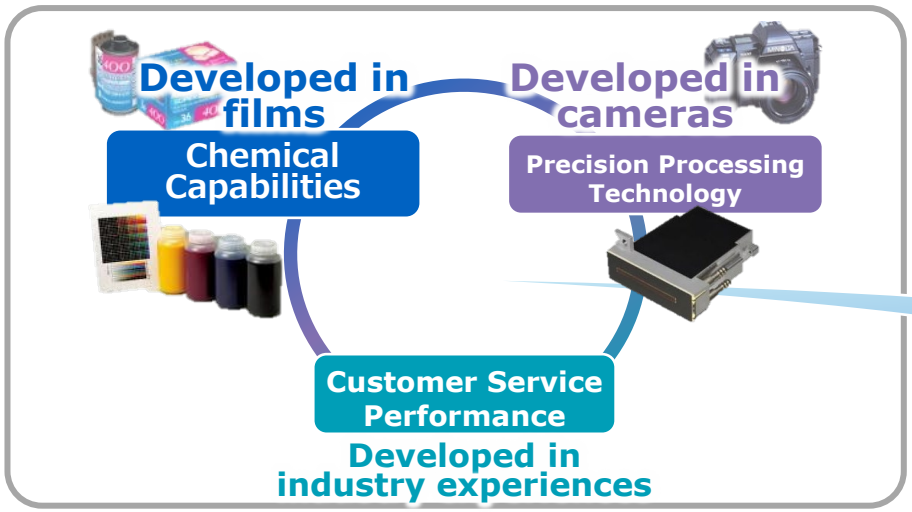
Printed Circuit Boards

Displays

Soft packaging and Packages

IJ Components Business

IJ Components Business | Sources of our Strengths



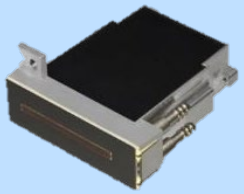
Adopted in Industry Processes thanks to Overwhelming Reliability

Superiority in Industrial Applications

Sign Graphics

Material Compatibility
Resistance to strong solvents, acids

Varied Ink options
Compatible with low/high-viscosity ink



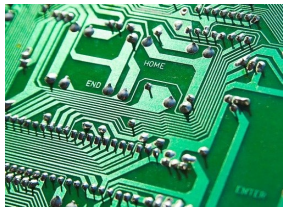
High Precision/Resolution
Micro-droplets, high-density nozzles, impact precision

Productivity
High-speed drives, Multiple nozzles

Head × Ink Matching Proposals

High Reliability
Long-lasting actuators
High Temperature Compatible

Displays



Printed Circuit Boards

Market Characteristics and Customer Trends

Foundation Domain

- Stable Market with existing products
- Increasing demand for environment friendly inks such as Water-based, UV, Dry-process ink

Sign Graphics

Solvent Printer

Commercial Print

Textile Print

Growth Domain

- Higher technical performance and special customization make High Added Value
- Transform customers' Workflow by proposal of entire inkjet system

Displays

Printed Circuit Boards

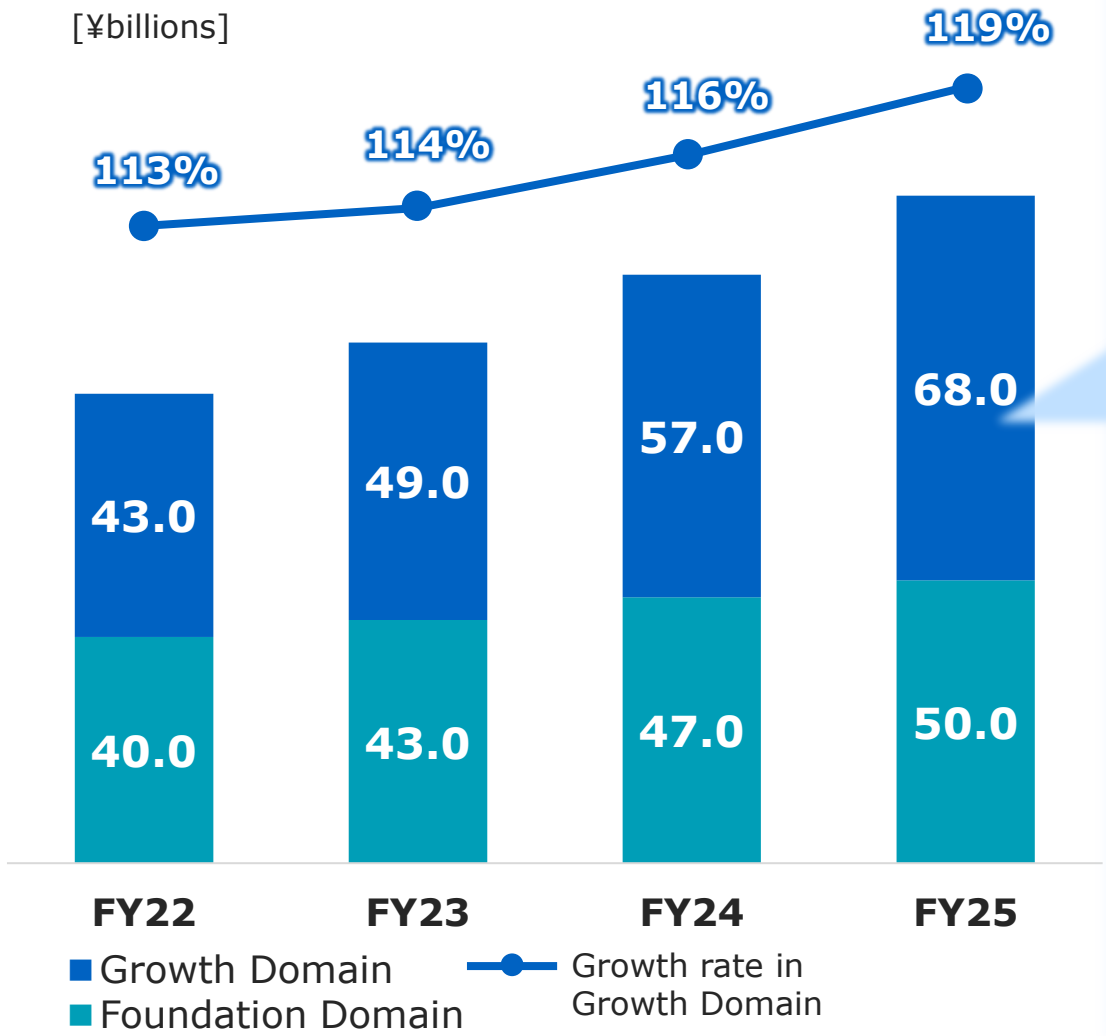
Label-less Print

Next-gen solar panels

Target Market and Growth Potential

KONICA MINOLTA 150 YEARS

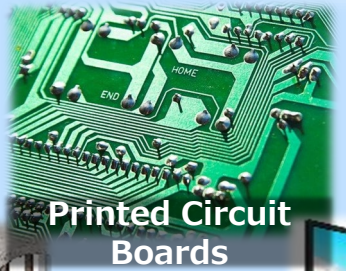
Expect growth of more than 10% per year in growth domain



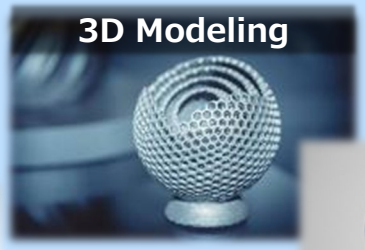
Investigated by KM / Printhead price base

Growth Domain

● **Print on Idustrial Products**
Patterning on Production Process



● **New manufacturing & value creation by IJ technology**
Direct patterning to object, 3D printer, Bio printer etc.

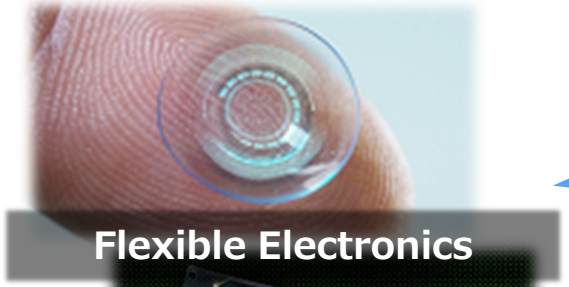


Expansion of Target Market

KONICA MINOLTA 150 YEARS

Growth Domain

New Manufacturing

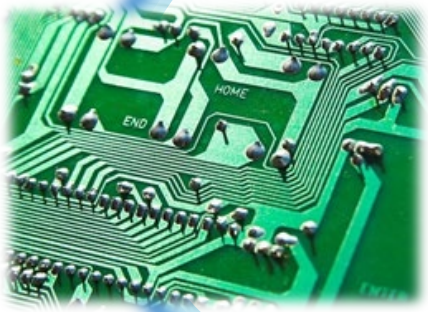

Flexible Electronics


3D Modeling


Painting Alternative

Transform workflow by Inkjet

Electonic Devices Manufactirng



Special Printing Alternative


Construction Materials


Solar Cells

Package


Distribution

Efforts to Resolve Material Issues

Contribute to solve social challenging by INKJET

Improving fulfillment in work and corporate dynamism

Transform workflow

- Better work environment
- Simplify supply chain by reduced processes
- Reduce downtime & improve productivity

Addressing climate change

Reduce environmental load

- Reduce industry wasted water
- Reduce drastically VOC, CO_2 emission

Using limited resources effectively

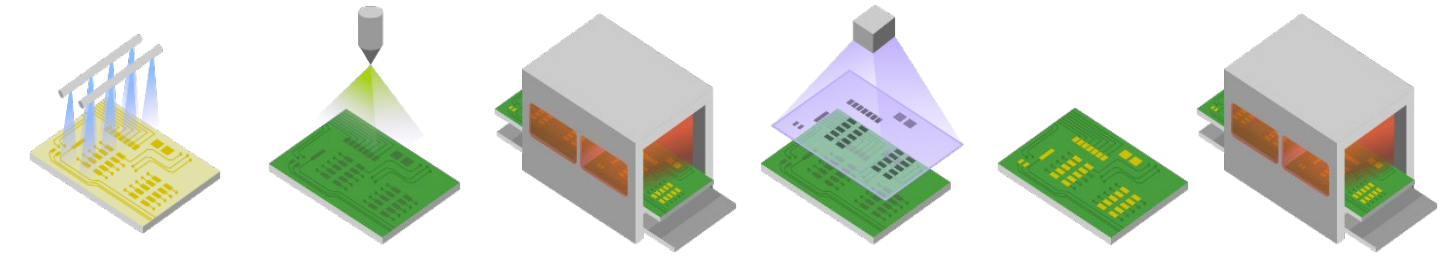
Reduce material stock, wastes

- Reduce print plate, chemicals, material stock, wastes, at customers
- Reduce industrial wasted water

Transform of Printed Circuit Board Solder Mask Process

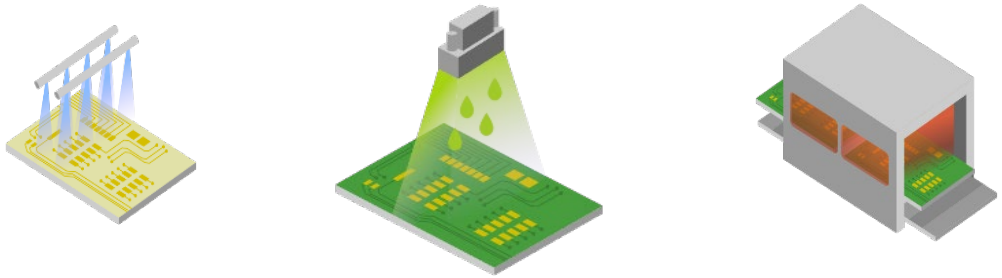
KONICA MINOLTA 150 YEARS

Pattern generation process with conventional method (photographic development-type)



Cleaning ▶ Full-surface coating ▶ Preliminary drying ▶ UV exposure ▶ Developing ▶ Drying

By Inkjet Process



Cleaning ▶ **Inkjet printing** ▶ Drying

VOC reduction*1 20,000t/Year
60% of VOC emission in Tokyo per year

Wastewater reduction*2 2.25Mil t/Year
80% of industrial waste in Tokyo per year

Improvement of work environment

Material cost reduction 70% (100 pieces/lots)

*1.Total amount of all industries in Tokyo Source: Inventory report by Ministry of environment [2020].

*2.The amount of waste rules by the industrial waste disposal law (Researched by Tokyo government office[2018])

※Reduction amount : A trial calculation is based on the record of factory 6mil.M2 capacity under the condition of all solder resist in the world are changed to inkjet. (source: Fuji Kimera)

Transform of Production Process for the Next-gen Display

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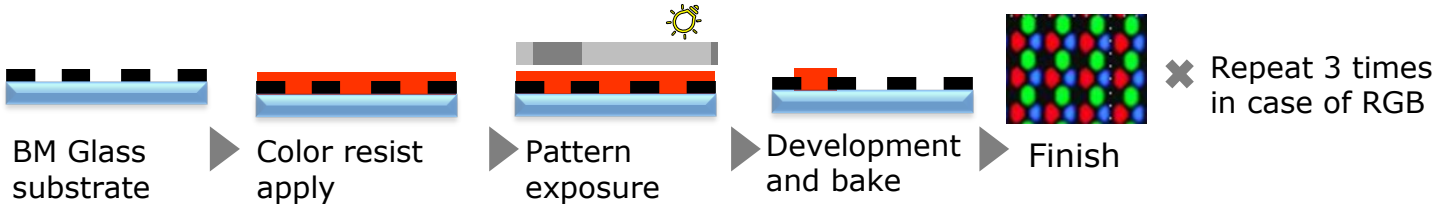
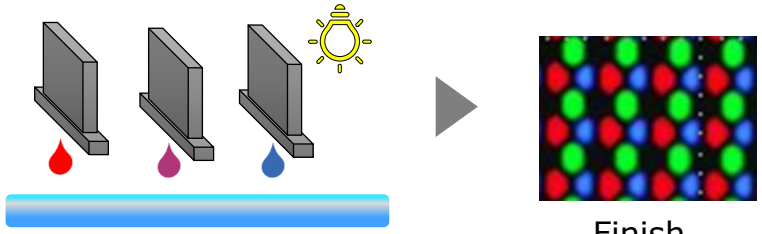
Bump formation with conventional method (Photographic development type)



Inkjet Process

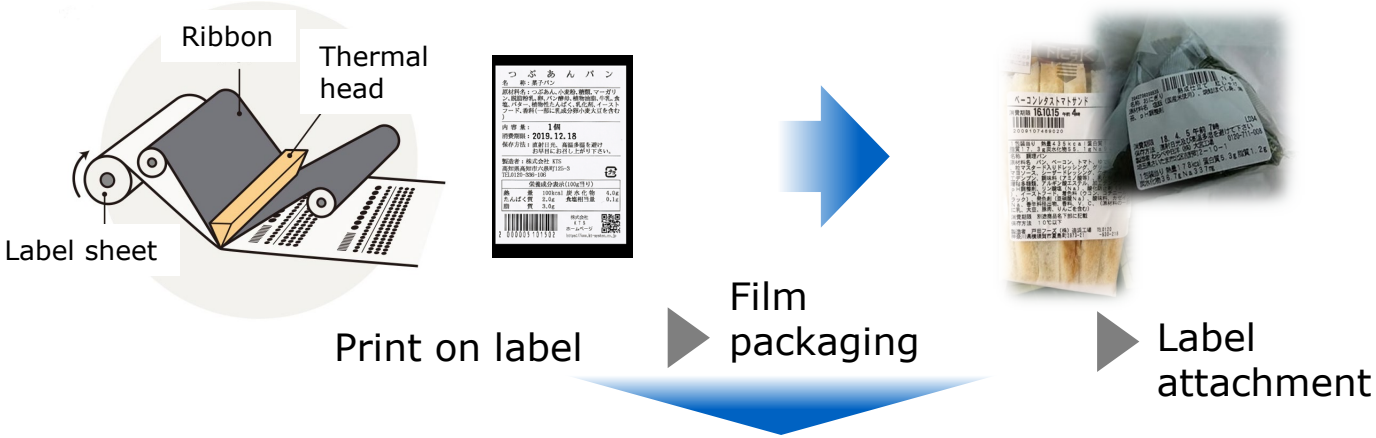


Inkjet print

- VOC reduction
- Significant reduction of material loss
- Improvement of work environment
- Reduction of process (Mask less)
- Less damage on raw material
- Uniformity by thin IJ coating

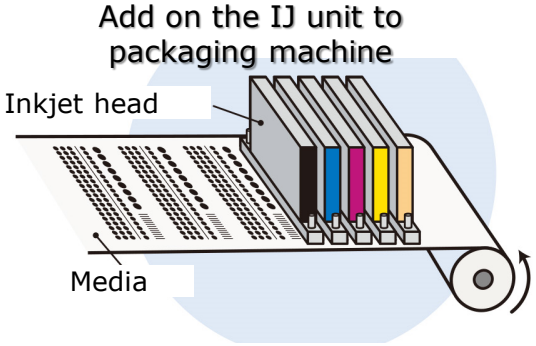
Drive Label-less by Direct IJ Print

Conventional Process: Heat transfer ribbon print



Inkjet Process

Direct inkjet print on film, during packing process



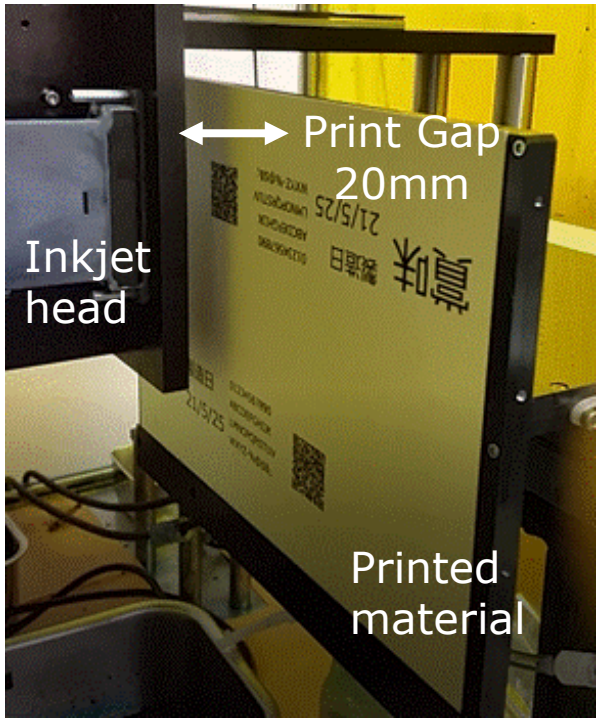
Courtesy of Fuji Machinery Co., Ltd.
And MST Co., Ltd.

- Significant reduction of material loss (Label, ink ribbon)
- Huge reduction of down time
  Ribbon change is not necessary
- CO2 Reduction 2300t/year
  25m swimming pools x 23 *
- Environmental load reduction by water base ink
- Colorization and more information

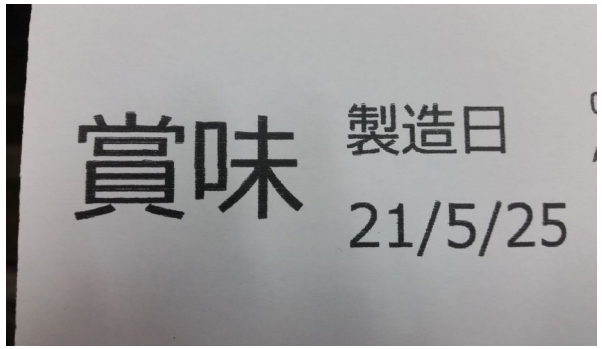
*In case pool size 25x13x1.5m

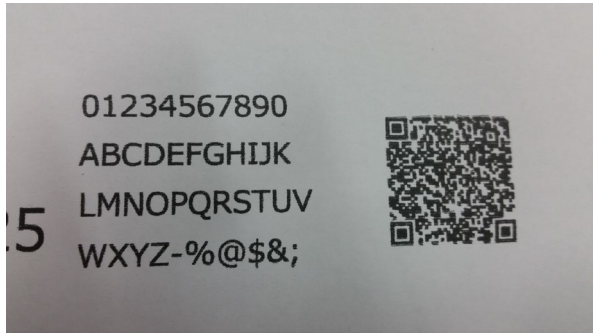
Productivity Improvement by Revolutionary High-Gap Print

Printer image and Printed samples



Printed samples (Gap 20㎜)





Production improvement
(Reduction of Media attack by higher gap)

Colorization, more information, two-dimensional code print

No need of label stock

Simplify the process

Colgate, textile, label etc.
Where higher gap print is required

Contributing to labor-saving and environmental friendliness by INKJET


KONICA MINOLTA
150
YEARS

Appendix

IJ component Products/Service list

Inkjet print head

Digital wave form

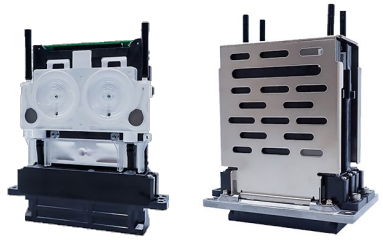
KM512/1024series

KM512/1024iseries

KM1800series

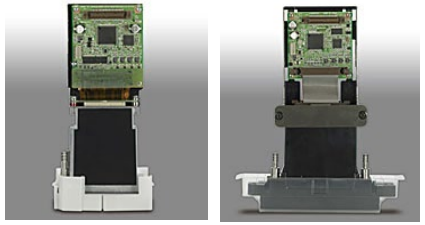
Analog wave form

KM1024a series



KM800series

Control system

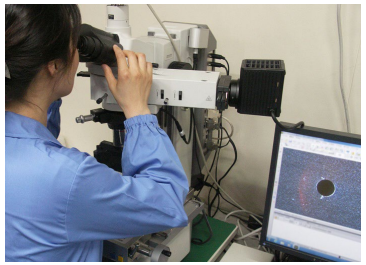


Ink

Customer support

Drive wave form
Jetting test

On site support



Failure analysis

Glossary

Words	Meaning
Material Compatibility	Matching between Ink or chemical and material or components which compose of Inkjet head. This is very important especially in industry sector, where the special kind of chemical is used, or much severe conditions such for temperature, humidity etc is required.
Inkjet textile printing method	Method for printing directly to cloth fabric (textile printing) with an inkjet. Because it does not require the plate-making and color paste preparation required by traditional screen textile printing, and the ink can be applied only where needed, it has attracted attention as an innovative dyeing method that makes multi-product, small-lot production quick, easy, and inexpensive, and makes textile printing more environment-friendly.
Nassenger	Our product brand of inkjet textile printers. It manages to maintain both sharpness and high concentration thanks to its small-droplet, high-density, multi-nozzle inkjet printheads, newly developed for textiles. As a fabric printer, it achieves top-class speed and markedly enhances production efficiency. Thanks to our proprietary material and color management technologies, it can reproduce smooth gradients and subtle color tones while achieving the highest levels of ink fastness and dye concentration.
AccurioJet	Our product brand for digital printing system using the inkjet technology. Achieved important functions as production machines such as "high image quality," "diversity of print media," "stability," and "high productivity."