



Precision Machinery Company - Medium-to Long-term Direction

July 8, 2021

Tetsuji Togawa
Executive Officer
President of Precision Machinery Company

Looking ahead,
going beyond expectations

Ahead > *Beyond*

株式会社 荏原製作所

Long-term vision, "E-Vision2030"

Precision Machinery Business: Contribution to Achieve Our 10 Year Vision from Now

In Feb 2020, established a Long-term Vision: E-Vision 2030
10-Year vision to solve material issues integrating a global market-in approach

5 Material Issues (Materiality)



1. Contribute to the creation of a sustainable society



2. Elevate standards of living and support abundant lifestyles for all



3. Conduct comprehensive environmental management

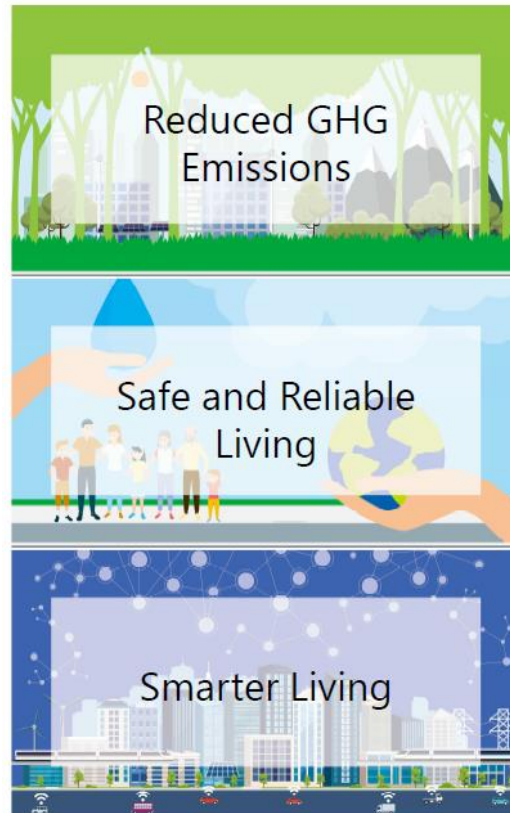


4. Promote working environments that encourage challenge



5. Enhance corporate governance

Outcomes



10-Year Vision

Social/Environmental Value

Solve social issues through our business:

- Reduce GHG emissions equivalent to around 100 million tons of CO2
- Deliver water to 600 million people
- Contribute to development of ICAC5...Challenge 14 Å

Economic Value

- ROIC over 10.0%
- Roughly 1 trillion yen in sales

Indicator of Corporate Value

- 1 trillion yen in market capitalization

Medium-term management plan, “E-Plan2022”

Precision Machinery Business Initiatives

Growth Strategy of Precision Machinery Business

Basic Policies

- Expand market share in existing markets by transitioning from a supplier of standalone equipment to a solutions provider
- Promote production efficiency, including increasing automated plants, and strengthen global supply chain

Operating Income
Target

2020 Actual
8.1%



2022 Target
13.0% or higher

Major future initiatives

- Install new assembly line at the Kumamoto Plant
- Promote production of major components at overseas bases
- Increase share of Chinese market by strengthening sales capabilities
- Complete construction and start operation of dry vacuum pump overhaul base in China
- Construct a new equipment building at Fujisawa Plant

- : Increase market share
- : Improve profitability



Image of completed overhaul base



CMP Technology Trends and Production System

July 8, 2021

Seiji Katsuoka
Executive Officer and Division Executive
Equipment Division, Precision Machinery Company

Looking ahead,
going beyond expectations

Ahead > *Beyond*

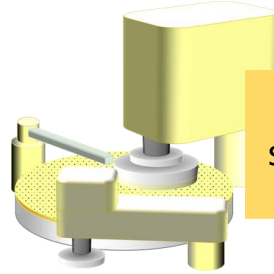
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Table of Contents

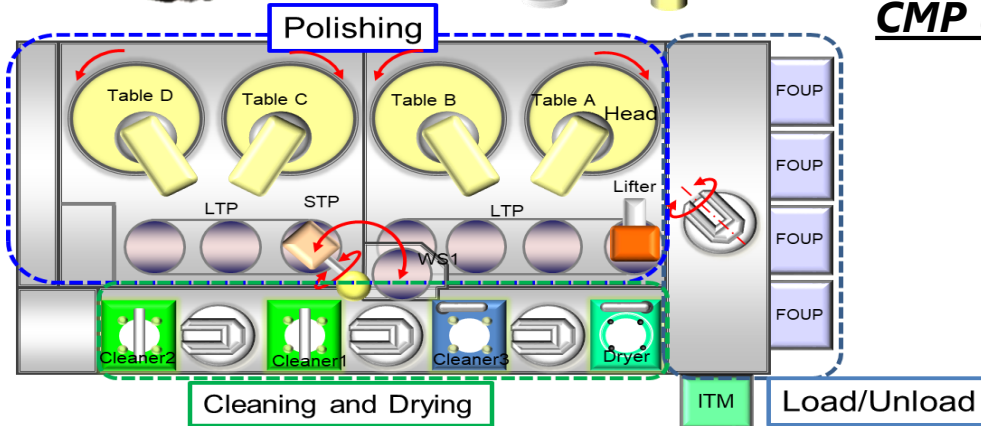
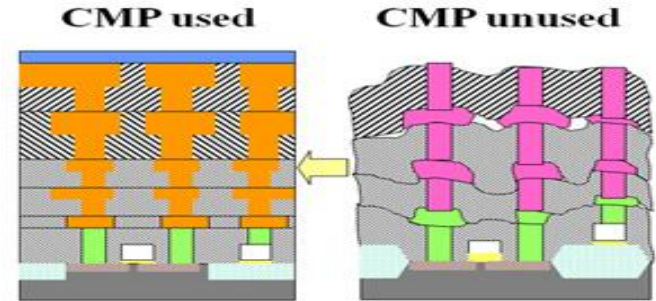
1. What is CMP?
2. CMP Process by Device and Adoption of Ebara Products
3. Semiconductor Technology Trends and CMP
4. CMP Development Trends
5. Production System and Manufacturing IT System

1. What is CMP?

Planarization technology of several nm level

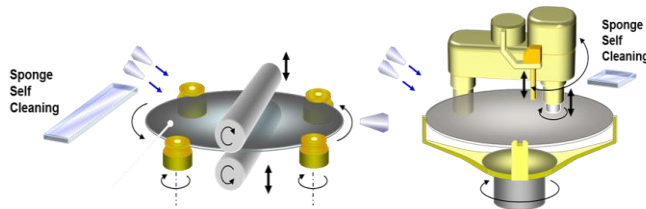


Ultra-high-precision sensor and film-thickness monitoring technology



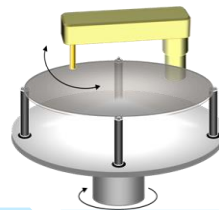
CMP (Chemical Mechanical Polisher) Systems

- ✓ Equipment for planarizing patterns on silicon wafers during semiconductor device manufacturing
- ✓ Integration of wafer polishing to achieve planarization at the level of several nm, process control technology and fine-particle cleaning technology at the level of several tens of nm
- ✓ Competitive edge built with abundant know-how and patents based on nearly 30 years of CMP experience



Cleaning technology at several 10nm level

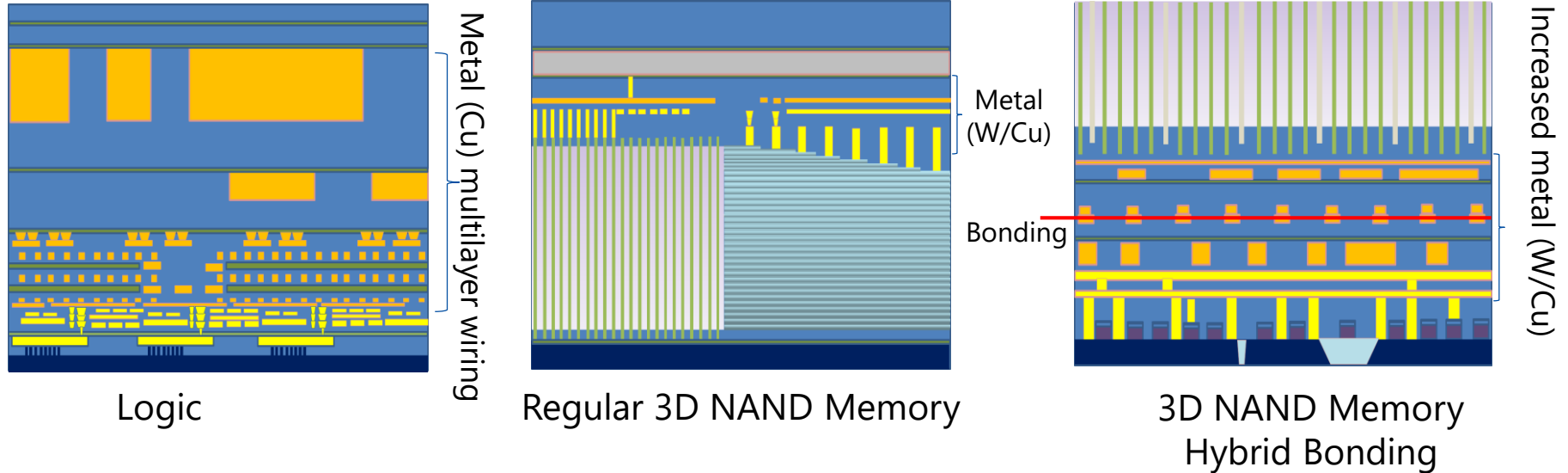
Non-contact cleaning technology



Water-mark-free drying technology

2. CMP Process by Device and Adoption of Ebara Products

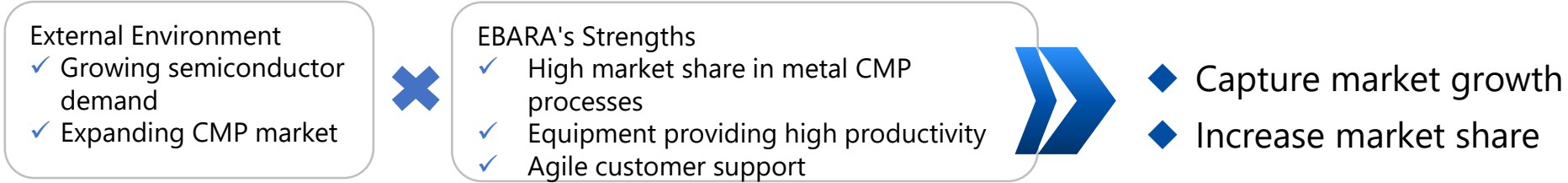
Image of Layer Structures



- ✓ Logic: High share in metal CMP. Cu (copper) wiring requires CMP process for 10 or more layers.
- ✓ Memory: High share in metal CMP. Non-metal CMP processes evaluations and orders started to increase.
- ✓ New CMP process: CMP processes used before and after bonding with hybrid bonding structure. More metal CMP processes used due to structural changes.

3. Semiconductor Technology Trends and CMP

Image of CMP Business Growth toward 2030



Global demand for semiconductors is increasing significantly in a wide range of fields due to the progress of ICAC5.

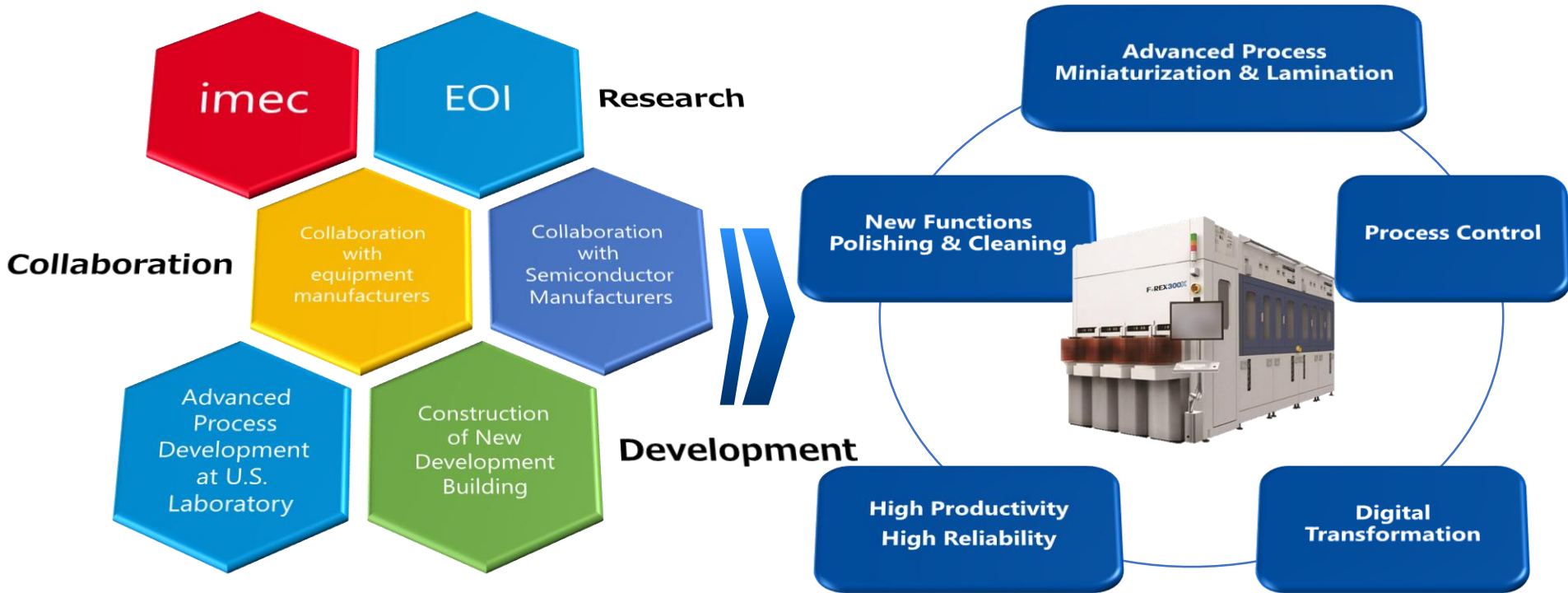
CIS/MEMS sensors	Cloud data servers	AI Semiconductors	EV and AV	5G mobile communication

Source of images : <https://www.photo-ac.com/>

CMP will play even more important role in semiconductor manufacturing in the future

- ✓ Demand for CMP is expected to increase due to increase of product markets requiring semiconductors, and increase in the types of semiconductors.
 - ✓ The number of CMP processes is expected to increase due to further layer increase as a result of advanced technology nodes and changes in semiconductor structures to improve semiconductors performance.
- ⇒ CMP market is expected to grow to be 1.5 times in 2030 (EBARA survey, vs. 2020)

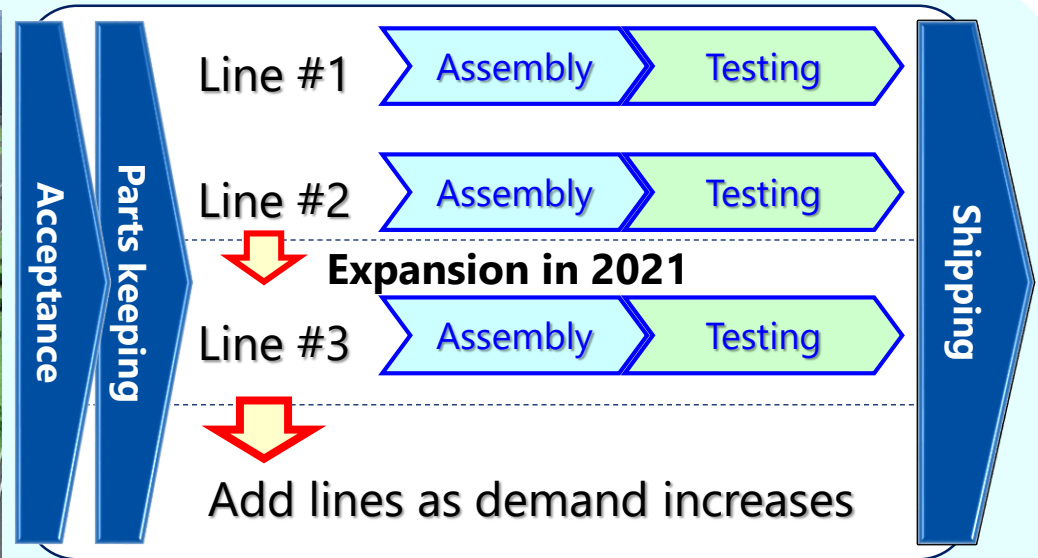
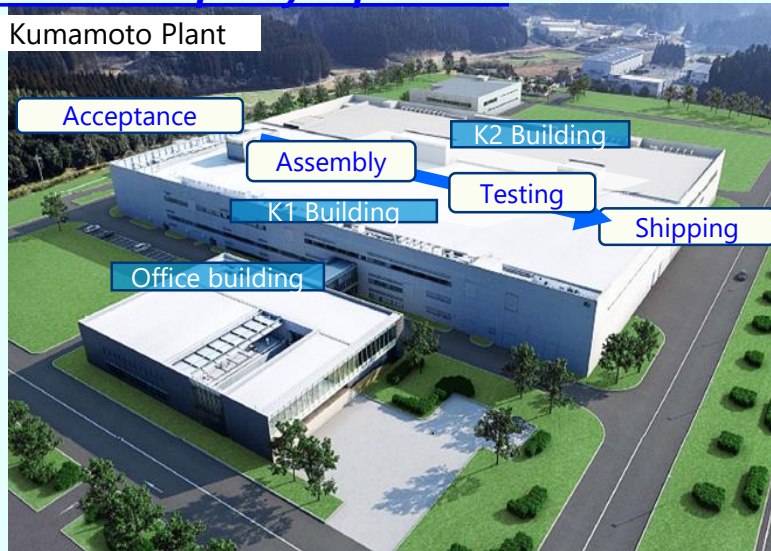
4. CMP Development Trends



EOI: EBARA Open Innovation, a joint research framework with universities
imec: An international research Institution

5. Production System and Manufacturing IT System

Production capacity expansions



Line expansion (2 lines ⇒ 3 lines)

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⇒

Cycle time reduction (high-density process work and short lead time)

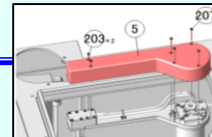
**Production Capacity:
1.5 times or higher vs. FY2020**

Continuously Evolving Manufacturing Systems

Logistics system

MES (Manufacturing Execution System)

AIE (Assembly Instruction Evidence)



Conveyor (RFID-identified stocking) Digital picking (Lamp-guided delivery)

Operation Plan

AIE (Work Instruction/Check)

Paperless (Electronic forms)

Dashboard (Area map)

Automated test (Labor saving)

Promote Digital Transformation (DX) ⇒ Enhance Productivity and Production Capacity to Meet Demand

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