Welcome

Analyst Day | December 2022

Safe Harbor for Forward-Looking Statements

This presentation contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934 regarding the future financial performance, business prospects and growth of MKS Instruments, Inc. ("MKS" or the "Company"). These statements are only predictions based on current assumptions and expectations. Any statements that are not statements of historical fact (including statements containing the words "will," "projects," "intends," "believes," "plans," "anticipates," "expects," "estimates," "forecasts," "continues" and similar expressions) should be considered to be forward-looking statements. Actual events or results may differ materially from those in the forward-looking statements set forth herein. Among the important factors that could cause actual events to differ materially from those in the forward-looking statements are the need to generate sufficient cash flows to service and repay the substantial indebtedness MKS has incurred in connection with the acquisition of Atotech Limited ("Atotech"), the terms of the existing term loans under which MKS incurred such debt, MKS' entry into the chemicals technology business through its acquisition of Atotech, in which MKS does not have experience and which may expose MKS to significant additional liabilities, the risk of litigation relating to the Atotech acquisition, the risk that disruption from the Atotech acquisition materially and adversely affects MKS' businesses and operations, MKS' ability to realize the anticipated synergies, cost savings and other benefits of the Atotech acquisition, competition from larger, more advanced or more established companies in MKS' markets, MKS' ability to successfully grow its business and the businesses of Atotech, which MKS acquired in August 2022, and Electro Scientific Industries, Inc., which MKS acquired in February 2019, and financial risks associated with those and potential future acquisitions, including goodwill and intangible asset impairments, potential adverse reactions or changes to business relationships resulting from the completion of the Atotech acquisition, manufacturing and sourcing risks, including those associated with limited and sole source suppliers and the impact and duration of supply chain disruptions and component shortages, and changes in global demand and the impact of COVID-19 or any other pandemic with respect to such disruptions, shortages and increases, risks associated with doing business internationally, including trade compliance, regulatory restrictions on MKS' products or components and unfavorable currency exchange and tax rate fluctuations, which risks become more significant as MKS grows its business internationally and in China specifically, conditions affecting the markets in which MKS operates, including fluctuations in capital spending in the semiconductor industry and other advanced manufacturing markets, and fluctuations in sales to MKS' major customers or disruptions or delays from third-party service providers upon which our operations may rely, the ability to anticipate and meet customer demand, the challenges, risks and costs involved with integrating or transitioning local and international operations of the companies MKS has acquired, risks associated with the attraction and retention of key personnel, potential fluctuations in quarterly results, dependence on new product development, rapid technological and market change, acquisition strategy, volatility of stock price, risks associated with chemical manufacturing and environmental regulation compliance, risks related to MKS' products resulting from defects, which would increase MKS' costs and seriously harm the business, financial condition, operating results and customer relationships, financial and legal risk management, risks related to cybersecurity and data privacy threats and the challenges associated with intellectual property protection, and the other factors described in MKS' Quarterly Report on Form 10-Q for the quarter ended September 30, 2022. MKS is under no obligation to, and expressly disclaims any obligation to, update or alter these forward-looking statements, whether as a result of new information, future events or otherwise after the date of this presentation.

Notes on Presentation

Use of Non-GAAP Financial Measures

This presentation includes financial measures that are not in accordance with U.S. generally accepted accounting principles ("Non-GAAP financial measures"). These Non-GAAP financial measures should be viewed in addition to, and not as a substitute for, MKS' reported results under U.S. generally accepted accounting principles ("GAAP"), and may be different from Non-GAAP financial measures used by other companies. In addition, these Non-GAAP financial measures are not based on any comprehensive set of accounting rules or principles. MKS management believes the presentation of these Non-GAAP financial measures is useful to investors for comparing prior periods and analyzing ongoing business trends and operating results.

MKS is not providing a quantitative reconciliation of forward-looking Non-GAAP gross margin, operating margin, tax rate, earnings per share, Adjusted EBITDA and Adjusted EBITDA margin to the most directly comparable GAAP financial measures because it is unable to estimate with reasonable certainty the ultimate timing or amount of certain significant items without unreasonable efforts. These items include, but are not limited to, acquisition and integration costs, acquisition inventory step-up, amortization of intangible assets, restructuring and other expense, asset impairment, and the income tax effect of these items. These items are uncertain, depend on various factors, including, but not limited to, our recent acquisition of Atotech and could have a material impact on GAAP reported results for the relevant period.

Pro Forma and Combined Company Financial Information

Except as noted below, all references to "pro forma" financial measures reflect the combined results of MKS and Atotech, which MKS acquired on August 17, 2022, calculated in accordance with Article 11 of Regulation S-X. All references to "combined" or "combined company" financial measures, as well as all references to "pro forma Adjusted EBITDA," reflect the combined results of MKS and Atotech but are not calculated in accordance with Article 11. In addition, except as otherwise indicated, Atotech financial information for periods up until MKS' acquisition of Atotech has been adjusted from International Financial Reporting Standards as issued by the International Accounting Standards Board ("IFRS") to GAAP and includes adjustments to conform to the accounting policies of MKS.

MKS has not identified material differences in Atotech's net revenue under GAAP and Atotech's historical reported net revenue under IFRS. Net revenues by end market for Atotech are based on MKS' understanding of end market uses for Atotech products and services.

For further information regarding Non-GAAP financial measures and the calculation of pro forma and other combined company financial information, please refer to the appendix at the end of this presentation.

Totals presented may not sum due to rounding.

Agenda

INTRODUCTION & STRATEGIC APPROACH
Foundational Technologies for a Connected World

John T.C. Lee, PhD
President & CEO

SEMICONDUCTORS
Critical Subsystems Powering the Connected World

Eric R. Taranto
SVP, GM Vacuum Solutions Division

ELECTRONICS & PACKAGING
Delivering Innovation at the Interconnect

James A. Schreiner
SVP & COO, Materials Solutions Division

Harald Ahnert
VP, GM Electronics, Materials Solutions Division

— 15 minute break —

SPECIALTY INDUSTRIAL
Adding Value through Proprietary Technologies

Mark M. Gitin, PhD
SVP, GM Photonics Solutions Division

Gertjan van der Wal
VP, GM General Metal Finishing, Materials Solutions Division

FINANCE
Foundation for Long-Term Value Creation

Seth H. Bagshaw
SVP, CFO & Treasurer

Q & A

Foundational Technologies for a Connected World

John T.C. Lee, PhD
President & CEO

We go where the **hardest problems** are.

MKS: Technology-Driven Secular Growth Company

Foundational technology leader

Specializing in **precision solutions** for diverse end markets

Leveraging powerful secular trends

Miniaturization, **complexity** and **chemistry** drive the innovations that power our world

Attractive growth profile

Positioned for strong **EPS growth** and cash generation, with track record of execution

At a Glance

$4.4B
2021 PRO FORMA REVENUE[1]

$289M
2021 PRO FORMA R&D INVESTMENT[1]

$1.3B
2021 PRO FORMA ADJUSTED EBITDA[1]

~100%
SEMI CHIPS MADE WITH MKS PRODUCTS[2]

33K+
CUSTOMERS

20
LEADING POSITIONS IN PRODUCT CATEGORIES[3]

3,800+
PATENTS WORLDWIDE[4]

2,000+
ENGINEERS & SCIENTISTS

[1] See Slide 3 for additional information regarding the calculation of pro forma results of MKS and Atotech. R&D investment consists of R&D expenses
[2] Internal Company estimate
[3] Product categories where TechInsights and/or MKS estimate MKS is #1 or #2 in segment share
[4] Patents consist of issued patents for MKS and Atotech as of December 31, 2021

MKS is Foundational to Our Connected World…

… and We Are Deeply Engaged with the Digital Ecosystem

The Demands of the Connected World Are Accelerating

From the transistors on a chip, to the interconnects on a circuit board — **MKS is a key enabler**

DIGITAL DEVICE PROLIFERATION

Exploding Demand for **Electronic Devices** + **Growth in Applications** (IoT, AR/VR, etc.) =

Massive Demand for Semiconductor & Advanced PCBs

+

PRECISION ENABLES PERFOMANCE

More **Power & Performance** + **Smaller** Form Factors + **Lower Cost** =

Heightened Demand for Broad Expertise in Precision Manufacturing

MKS: Built to Capitalize on Secular Trends

Semiconductor

Deposition, Etch, Lithography, Inspection / Metrology, Wet Processing

Smaller Geometries (nm)

Vertical Scaling

Novel Materials

MINIATURIZATION

COMPLEXITY

CHEMISTRY

Electronics & Packaging

Laser-Based Manufacturing; Next-Gen Interconnect

Finer Features (µm)

More Layers

Novel Materials

Leveraging our Domain Expertise Across End Markets

PROPRIETARY CHEMISTRY

PRESSURE & FLOW MEASUREMENT & CONTROL

PLASMA & REACTIVE GAS

OPTICS & OPTICAL SUBSYSTEMS

LASERS

...and many more

Specialty Industrial

- Surface Finishing / Functional Coatings
- Solar Manufacturing
- Synthetic Diamond Manufacturing
- Medical Diagnostics
- Ophthalmic Surgery

...and many more

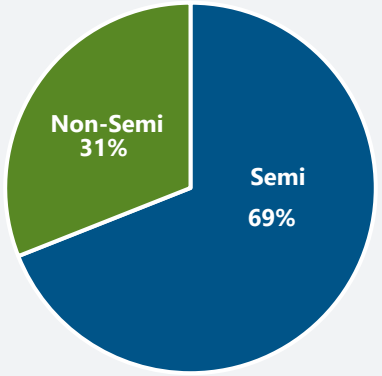
Leadership in Broad Set of Industrial Markets Offers Attractive Margins & Cash Flow

Evolution into Broad Foundational Technology Provider

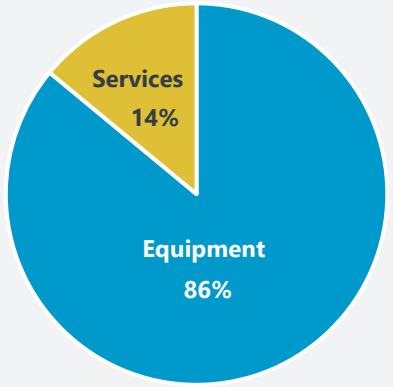
Significantly expanded financial and operational scale to **drive growth across a broader array of end-markets**

2015

REVENUE MIX



REVENUE STREAM

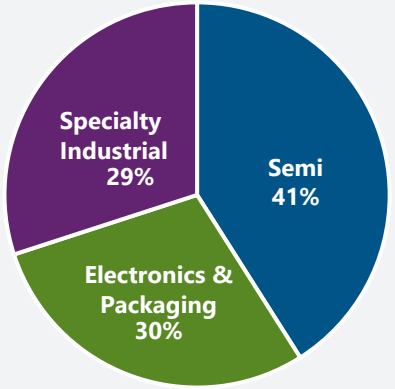


$0.2B
ADJUSTED EBITDA

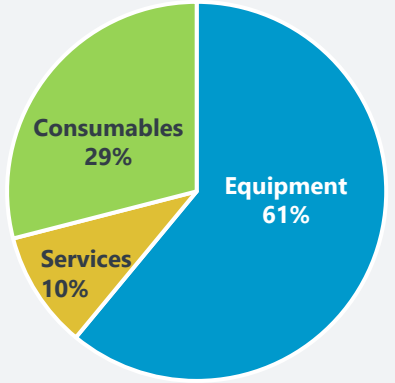
2,100+	EMPLOYEES
1,000+	PATENTS[2]
3,500+	CUSTOMERS
42%	TOP 5 CUSTOMER CONCENTRATION

2021 PRO FORMA[1]

REVENUE MIX



REVENUE STREAM



$1.3B
ADJUSTED EBITDA

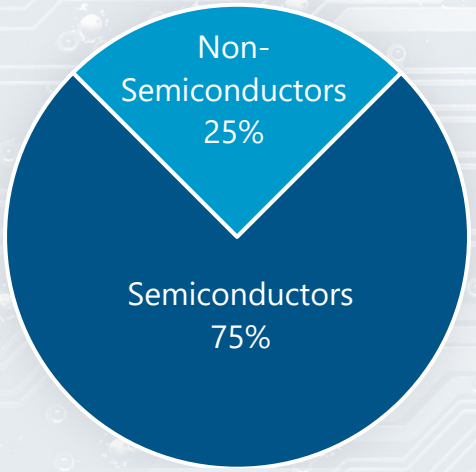
10,000+	EMPLOYEES
3,800+	PATENTS[3]
33,000+	CUSTOMERS
27%	TOP 5 CUSTOMER CONCENTRATION

[1] See Slide 3 for additional information regarding the calculation of pro forma results of MKS and Atotech [2] Patents consist of issued patents for MKS as of December 31, 2015
[3] Patents consist of issued patents for MKS and Atotech as of December 31, 2021

Significant SAM Expansion

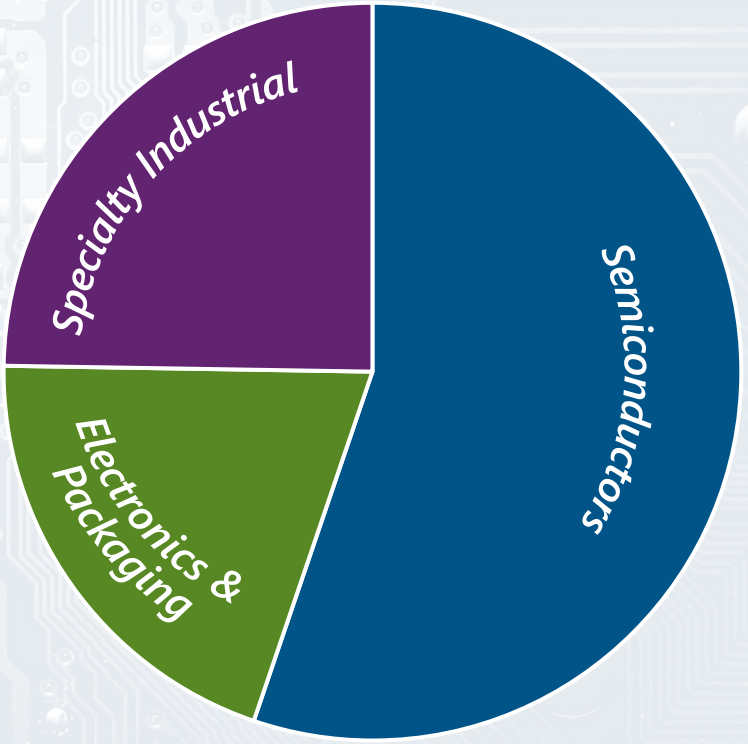
2015[1]

$6B



2022 Combined Company[1]

$25B



[1] *Internal Company estimates*

Semiconductor: Driving Innovation in Critical Subsystems

KEY ATTRIBUTES

Long design cycles, significant follow-on revenue, strong/deep customer relationships

APPLICATIONS

Deposition & Etch

- Vacuum solutions, power delivery, and reactive gas generation for advanced deposition & etch

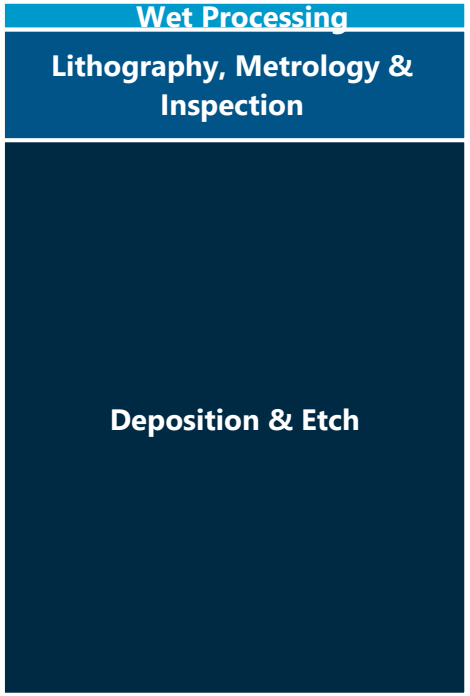
Lithography, Metrology & Inspection

- Optical subsystems for DUV, EUV & High-NA EUV
- Precision Motion solutions for wafer positioning

Wet Processing

- Dissolved gases for wet clean applications

REVENUE MIX



PRO FORMA 2021[1]: $1.8B

LEADERSHIP POSITION[2]

#1

- Pressure & Flow Measurement & Control
- RF Power Supplies
- Microwave Power
- Plasma & Reactive Gas
- Tool, Safety Chamber, Network
- Optical Fiber Thermometry

#2

- Control & Iso Valves
- FTIR Gas Analysis

[1] See Slide 3 for additional information regarding the calculation of pro forma results of MKS and Atotech [2] Product categories where TechInsights and/or MKS estimate MKS is #1 or #2 in segment share

Electronics & Packaging: Enabling Next Generation Devices

KEY ATTRIBUTES

Long design cycles, increased precision, tighter integration between chemistry solutions & laser processing

APPLICATIONS

Electronics Chemistries & Plating

- Electroless plating
- Electrolytic plating
- Surface treatment
- Surface finishing

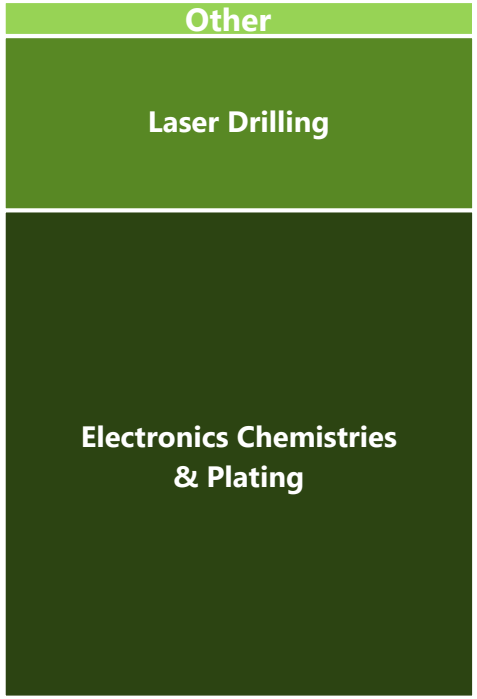
Laser Drilling

Laser via drilling for Flexible and HDI PCBs, as well as package substrates

Other

- Laser and vacuum technology for display solutions
- Testing systems for MLCCs

REVENUE MIX



PRO FORMA 2021[1]: $1.3B

LEADERSHIP POSITION[2]

#1

- UV Nanosecond Pulsed Lasers
- Flex PCB Via Drilling Systems
- Electronics Plating Chemistries
- Horizontal PCB Plating Equipment

Emerging Growth Opportunities

- Integrated solutions for next-gen package substrates, HDI & Flex PCBs
- Ultrafast UV Lasers (Picosecond and Femtosecond)

[1] See Slide 3 for additional information regarding the calculation of pro forma results of MKS and Atotech. [2] Product categories where TechInsights and/or MKS estimate MKS is #1 or #2 in segment share

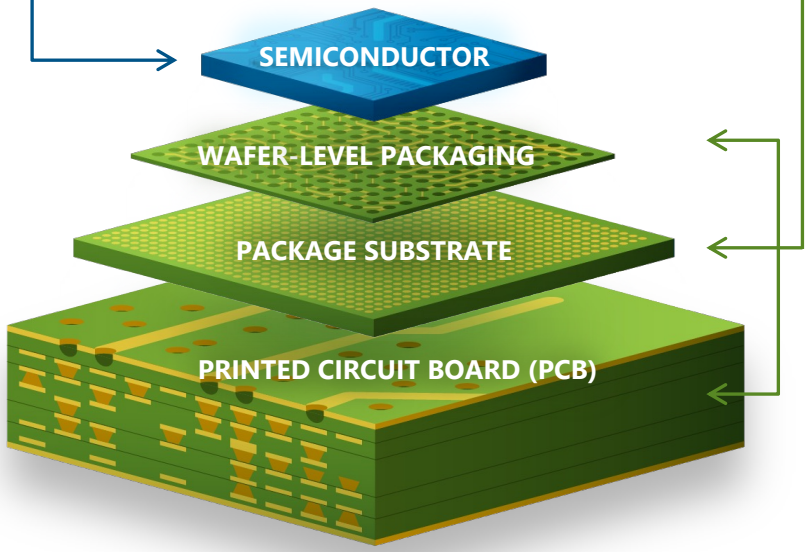
Enabling the Core Building Block of Advanced Electronic Devices

Semiconductor

Critical subsystems & materials for **semiconductor** manufacturing

- *Leader in critical vacuum subsystems for deposition and etch, and emerging provider of photonics for lithography, metrology and inspection*

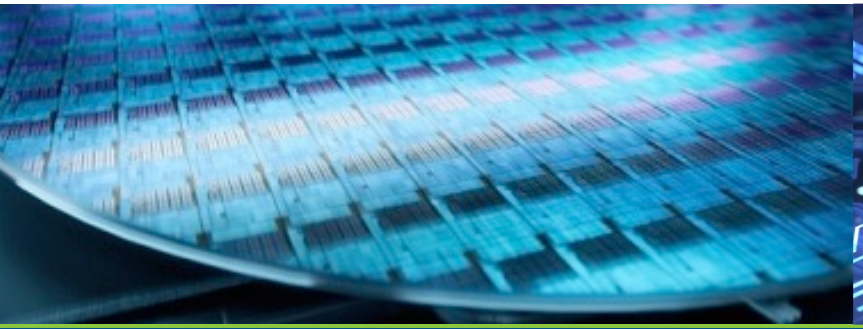
High Performance Compute Architecture

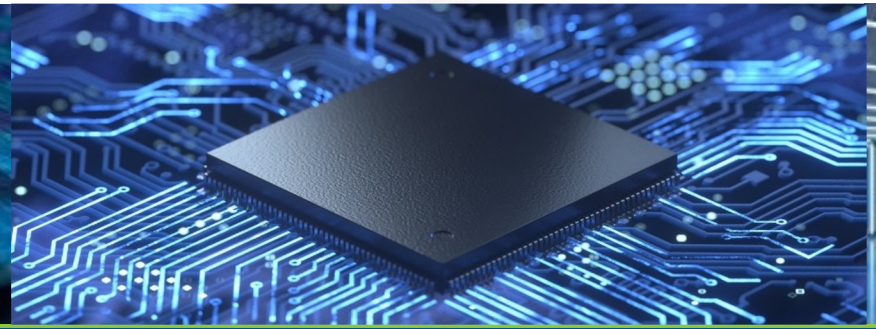


Electronics & Packaging

Subsystems, equipment & materials for **electronics & packaging**

- *Differentiated combination of electronics chemistry and laser drilling solutions to accelerate customer roadmaps in advanced PCB design and manufacturing*





Specialty Industrial: Harnessing Core Expertise Across Markets

KEY ATTRIBUTES

Differentiated technologies that solves specific needs for customers

APPLICATIONS

Industrial

- Vacuum solutions for synthetic diamond and solar manufacturing
- Functional coatings for corrosion and wear resistance
- Decorative surface finishing

Life & Health Sciences

- Optics and photonics for analytical instrumentation
- Lasers for ophthalmic surgery
- Vacuum solutions for medical equipment sterilization

Research & Defense

- Vacuum and photonics solutions for advanced research and quantum computing
- Lasers and photonics for remote sensing

REVENUE MIX

PRO FORMA 2021[1]: $1.3B

LEADERSHIP POSITION[2]

#1

- Laser Measurement Instruments
- Vibration Control
- High Performance Gratings
- Decorative Surface Finishing

#2

- Functional Coatings for Corrosion & Wear Resistance
- IR Optics
- Opto-Mechanics
- Component Test

[1] See Slide 3 for additional information regarding the calculation of pro forma results of MKS and Atotech [2] Product categories where TechInsights and/or MKS estimate MKS is #1 or #2 in segment share

Our Unique DNA is What Makes MKS Successful

Broad Domain & Process Expertise

- Vacuum
- Photonics
- Materials

Deep & Collaborative Customer & Ecosystem Relationships

- **Identify** Inflection Points
- **Develop** Integrated Design Cycles
- **Solve** Complex Problems

Innovation Multiplier

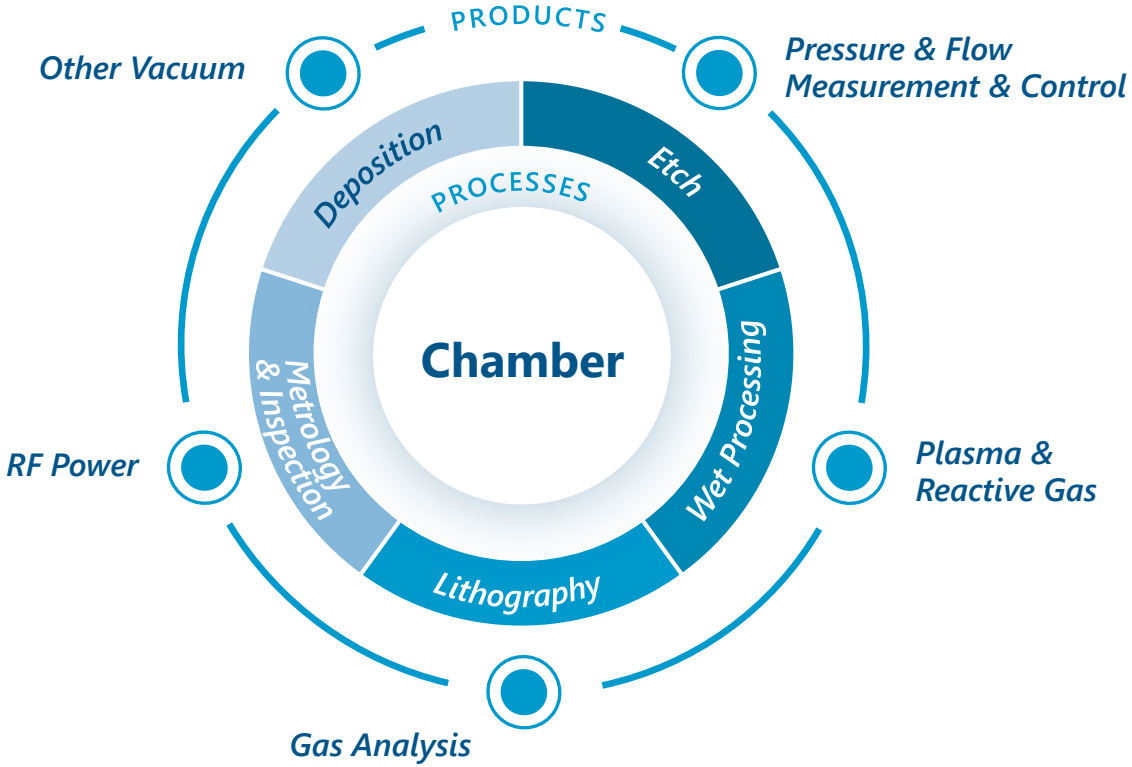
- Cross-selling to New & Existing Customers
- Accelerating Time to Market
- Innovating New Processes

Our "Surround" Strategy is How We Execute

December 2020 Analyst Day

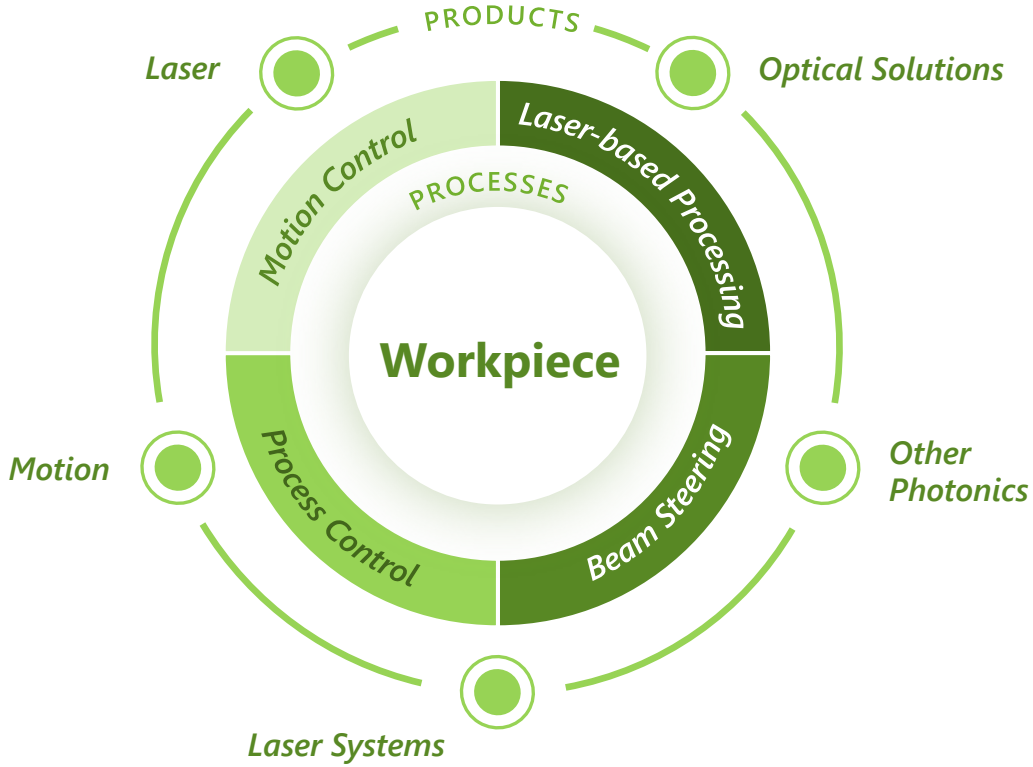
SEMICONDUCTOR

"Surround the Chamber®"



ADVANCED MARKETS

"Surround the Workpiece®"

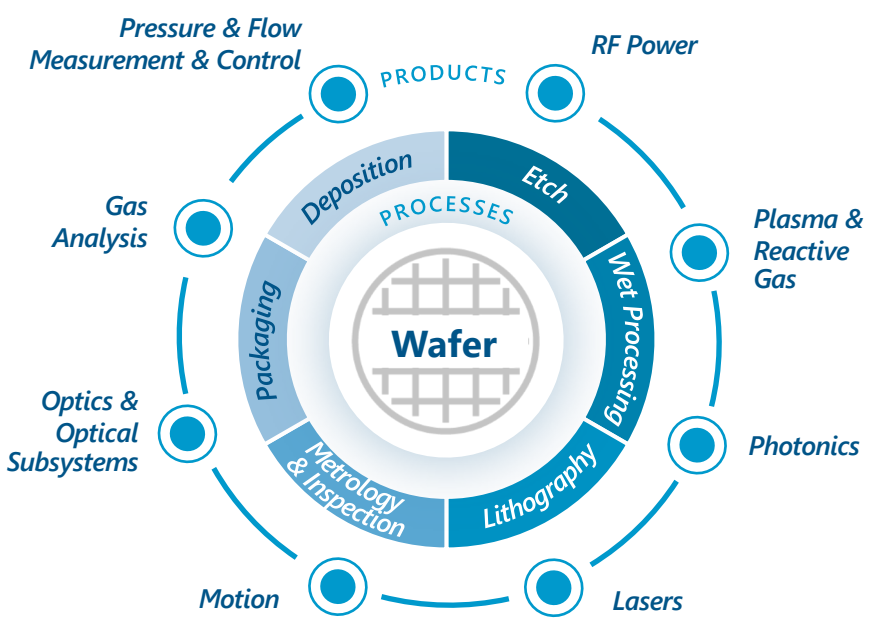


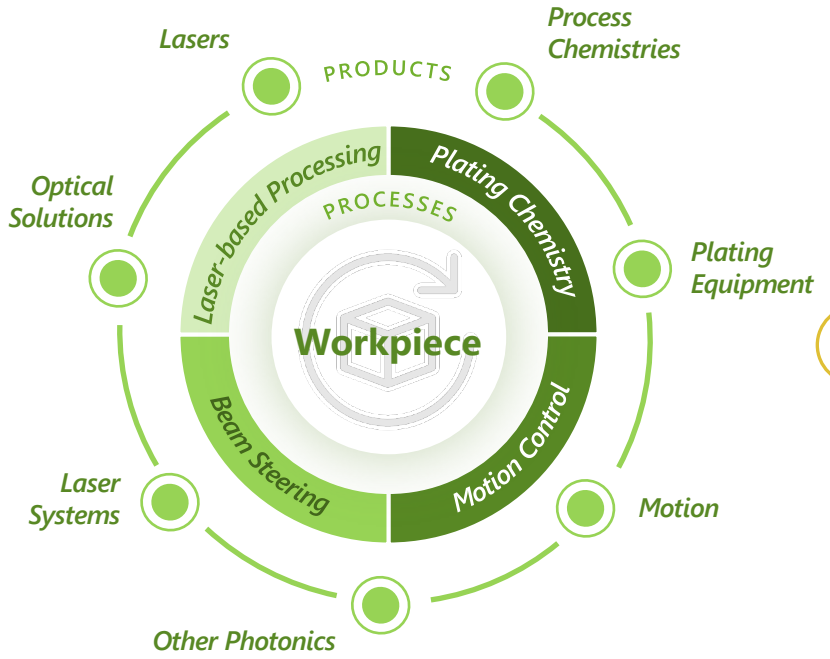
Our "Surround" Strategy is How We Execute

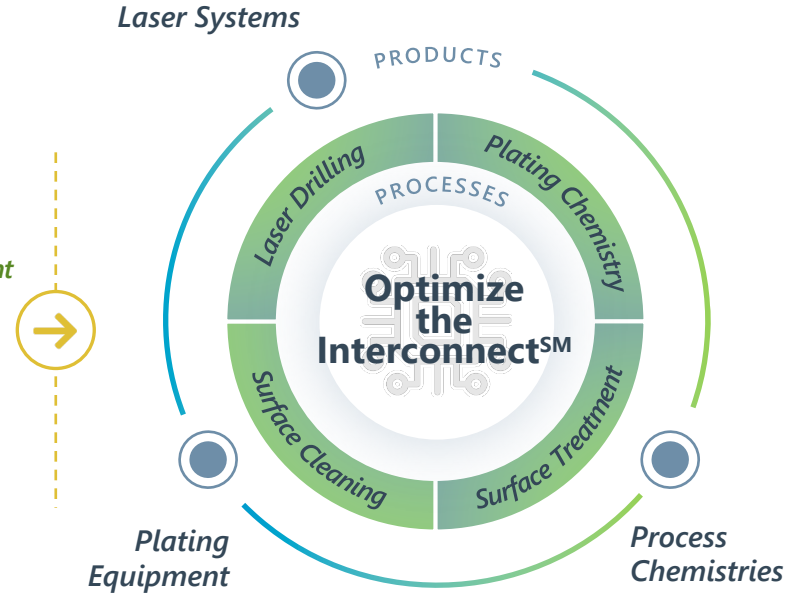
MKS Today: Foundational Solutions for Advanced Electronics

SEMICONDUCTOR
"Surround the Wafer℠"

ELECTRONICS & PACKAGING
"Surround the Workpiece®"







Our Long-Term Strategic Focus

Execute with discipline while investing in long-term opportunities

Deepen our collaboration with customers & deliver world-class service

Capture opportunities in attractive secular growth markets

Allocate capital effectively

Semiconductor

Well-positioned to enable leading edge inflections and **drive outperformance** vs. Wafer Fabrication Equipment (WFE)

Electronics & Packaging

Expanded capabilities position MKS to **Optimize the Interconnect℠** as new architecture design cycles start for next-gen electronics (e.g., 6G, HPC, etc.)

Specialty Industrial

Leverage domain expertise to deliver innovation across a wide variety of end markets

Capital Deployment Focused on Long-Term Value Creation

1 ORGANIC GROWTH & DIVIDENDS

- Strong organic investments
- Grow dividend over time
- Capex 3% - 5% of revenue

2 DEBT MANAGEMENT

- Accelerated debt paydown
- Opportunistic re-pricings
- Maintain strong liquidity

3 M&A / BUYBACK

- Disciplined M&A is a component of our growth strategy
- Opportunistic share buybacks
- Maximize long-term shareholder value

Strong Foundation of ESG Principles

ENVIRONMENTAL

Expanded reporting of **Scope 1, 2 and 3 emissions**

Launched **first ESG survey to top suppliers**

Implementing **energy efficiency measures**

SOCIAL

Developed **Global Environmental Health & Safety management system (MEHS)**

Implemented **global employee engagement surveys,** with strong and improving results

Extended **DEI training to all employees** and **set DEI goals for executives**

GOVERNANCE

> 75% of Board is Independent with average tenure of 4 years

Board & Executive Gender Diversity (33% for Board; 22% for Exec Team)

Direct ESG oversight from Board's Nominating and Corporate Governance Committee

MKS reporting is aligned with Sustainable Accounting Standards Board (SASB) and The Task Force on Climate-Related Financial Disclosures (TCFD) frameworks

MKS Portfolio Positioned Well for Global Sustainability Needs

END-MARKET SUSTAINABILITY

- Gas analyzers for **air monitoring and automotive emissions**
- Vacuum solutions for **synthetic diamond manufacturing** *(CarbonNeutral® product certified)*
- Pulsed lasers and gas controllers used in **solar cell fabrication**
- Chemistries for **metallization of solar modules**

PRODUCT SUSTAINABILITY

- Dissolved ozone delivery system, with **water recycling solution**
- Chemistries to **enhance corrosion protection for wind turbines**
- Environmentally sustainable chemistry alternatives **(Cr VI-free, Pb-free, Ni-free, CN-free)**
- Auxiliary equipment for the **reduction and treatment of wastewater**

MKS: Technology-Driven Secular Growth Company

Foundational technology leader

Specializing in **precision solutions** for diverse end markets

Leveraging powerful secular trends

Miniaturization, **complexity** and **chemistry** drive the innovations that power our world

Attractive growth profile

Positioned for strong **EPS growth** and cash generation, with track record of execution

Projected 2022 – 2027 Non-GAAP EPS CAGR of >10%[1]

[1] *Long-term model based on pro forma results of MKS and Atotech through September 30, 2022, plus the midpoint of the fourth quarter guidance provided on November 3, 2022,compared to 2027.*

SEMICONDUCTORS

Critical Subsystems Powering the Connected World

Eric R. Taranto
SVP, General Manager
Vacuum Solutions Division

mks

Key Messages

MKS is a leading critical solutions provider to the semiconductor industry

Attractive secular trends are driving long-term capital equipment investment

Differentiated portfolio and deep customer relationships position MKS to outperform WFE

Semiconductor: Driving Innovation in Critical Subsystems

KEY ATTRIBUTES

Long design cycles, significant follow-on revenue, strong/deep customer relationships

APPLICATIONS

Deposition & Etch

- Vacuum solutions, power delivery, and reactive gas generation for advanced deposition & etch

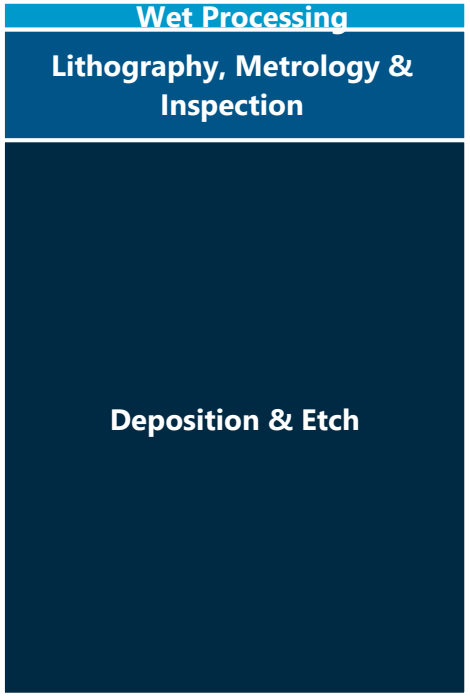
Lithography, Metrology & Inspection

- Optical subsystems for DUV, EUV & High-NA EUV
- Precision Motion solutions for wafer positioning

Wet Processing

- Dissolved gases for wet clean applications

REVENUE MIX



PRO FORMA 2021[1]: $1.8B

LEADERSHIP POSITION[2]

#1

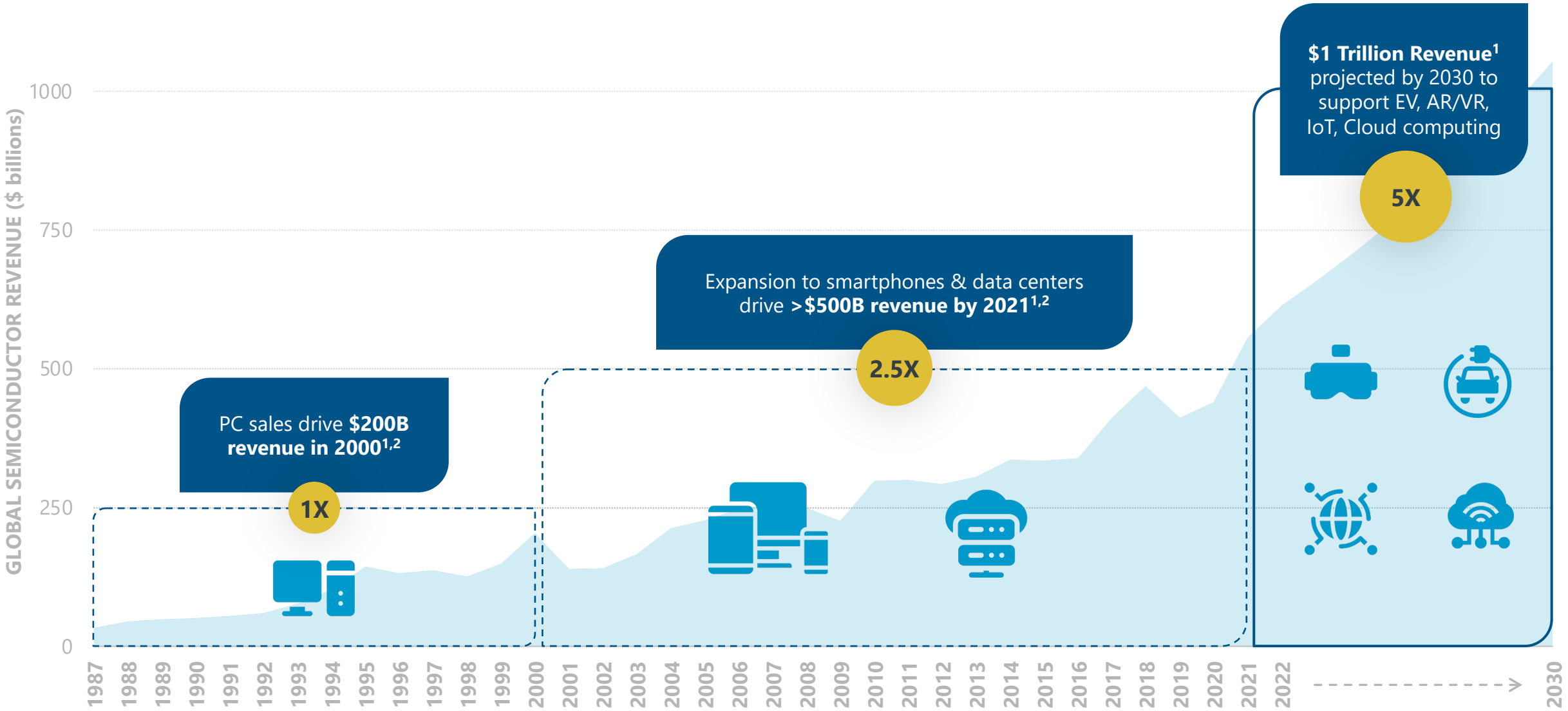
- Pressure & Flow Measurement & Control
- RF Power Supplies
- Microwave Power
- Plasma & Reactive Gas
- Tool, Safety Chamber, Network
- Optical Fiber Thermometry

#2

- Control & Iso Valves
- FTIR Gas Analysis

[1] See Slide 3 for additional information regarding the calculation of pro forma results of MKS and Atotech. [2] Product categories where TechInsights and/or MKS estimate MKS is #1 or #2 in segment share

Semiconductors Are Essential to the Connected World



[1] Semi.org [2] Internal Company estimate

The Demands of the Connected World Are Accelerating…

From the transistors on a chip, to the interconnects on a circuit board — **MKS is a key enabler**

DIGITAL DEVICE PROLIFERATION

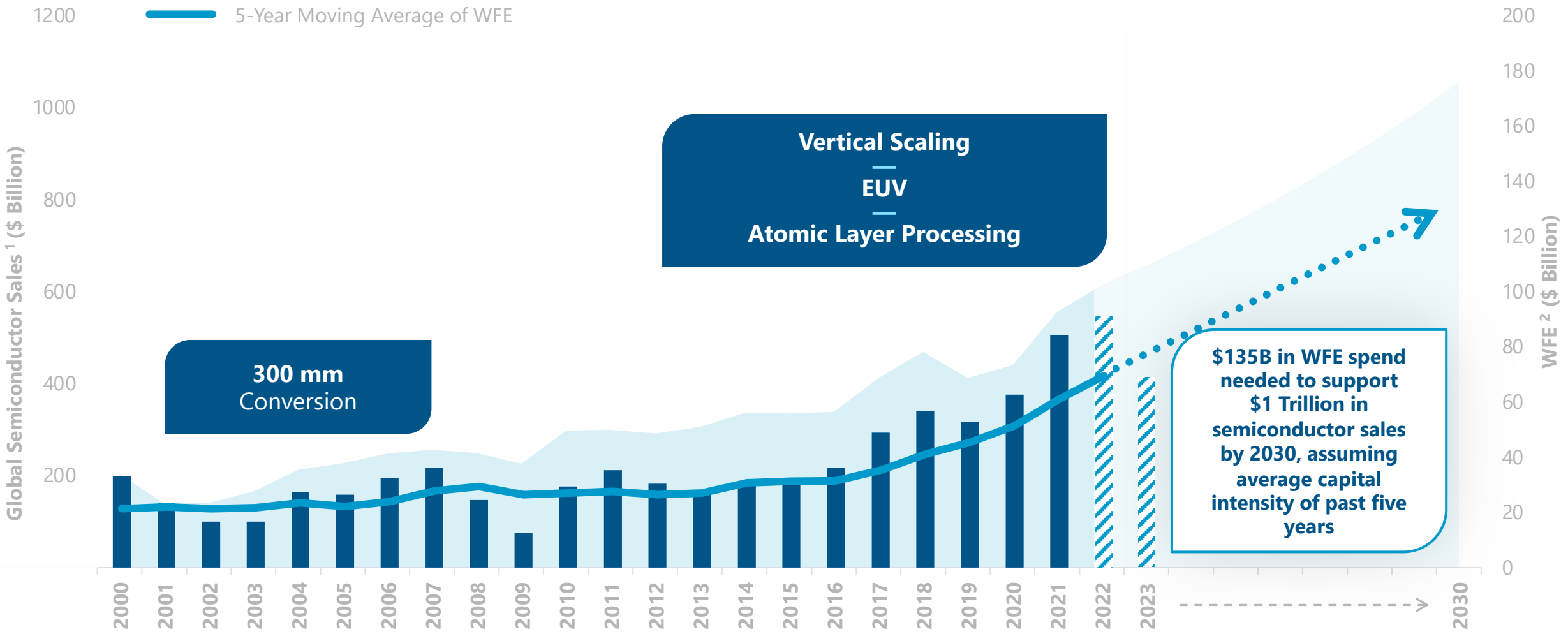
Exploding Demand for **Electronic Devices** + **Growth in Applications** (IoT, AR/VR, etc.) =

+

PRECISION ENABLES PERFOMANCE

More **Power & Performance** + **Smaller** Form Factors + **Lower Cost** =

…Requiring Growing WFE Investments

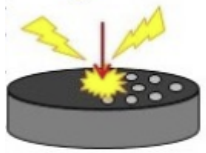


[1] TechInsights, [2] Blended average of estimates for 2022 and 2023 from Citi Research, Cowen, DA Davidson, Deutsche Bank, Loop Capital, Needham and Wells Fargo

MKS Enables More Semiconductor Process Steps Than Anyone Else in the Industry[1]

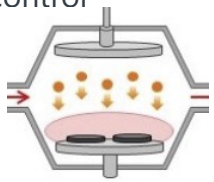
DEPOSITION

Pressure & Vacuum Measurement
Gas Delivery & Pressure Control
Plasma & Reactive Gas
RF Power
Temperature Sensing



ETCH

Pressure & Vacuum Measurement
Gas Delivery & Pressure Control
Plasma & Reactive Gas
RF Power
Temperature Sensing

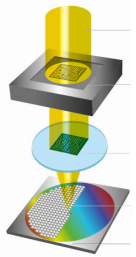


WET PROCESSING

Reactive Gases

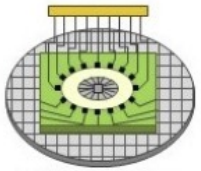
LITHOGRAPHY

Optics & Optical Subsystems
Precision Motion
Vibration Control
Light Source Assemblies



METROLOGY & INSPECTION

Optics & Optical Subsystems
Lasers
Precision Motion
High Performance DUV Thin Film Coating

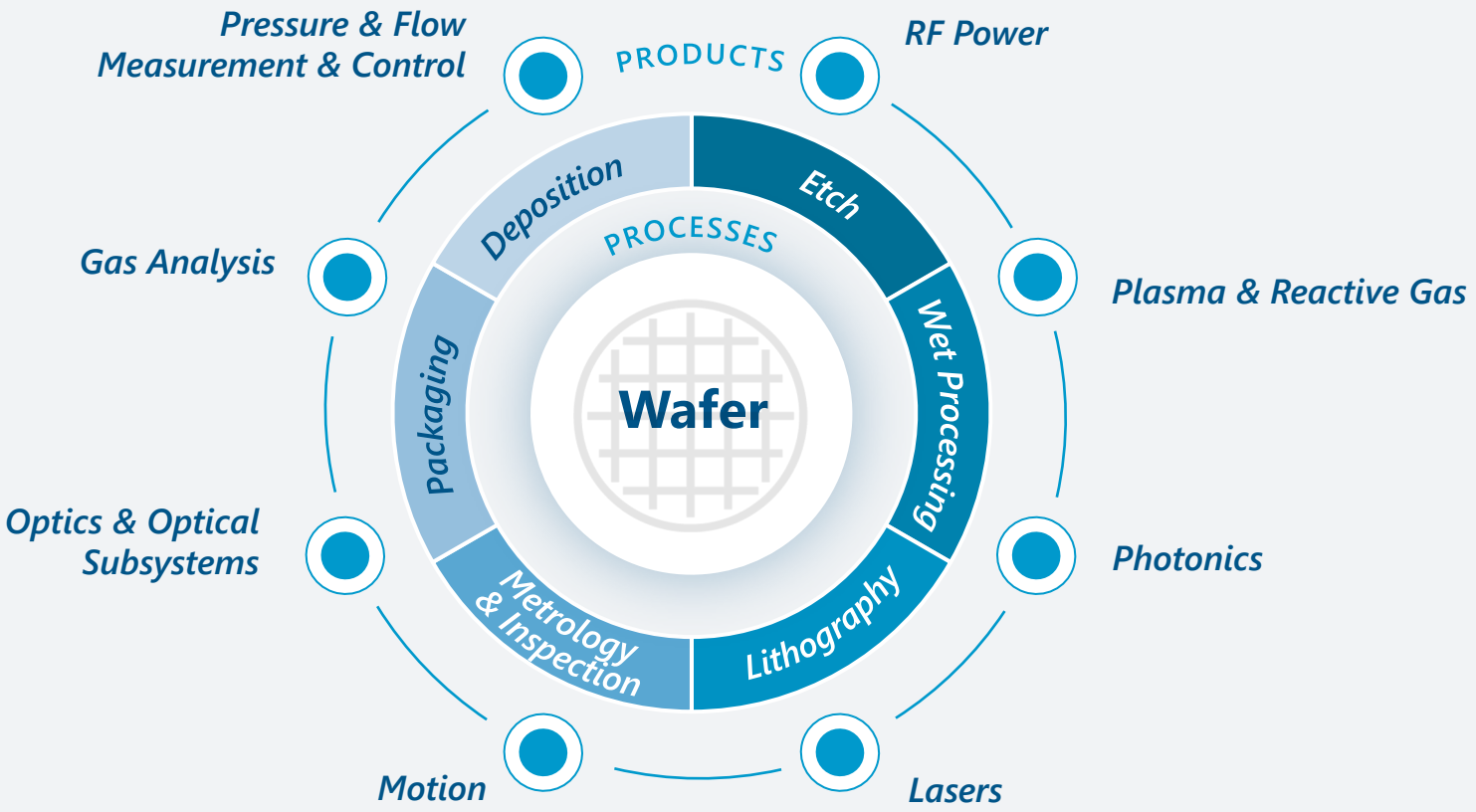


[1] *Internal Company estimates*

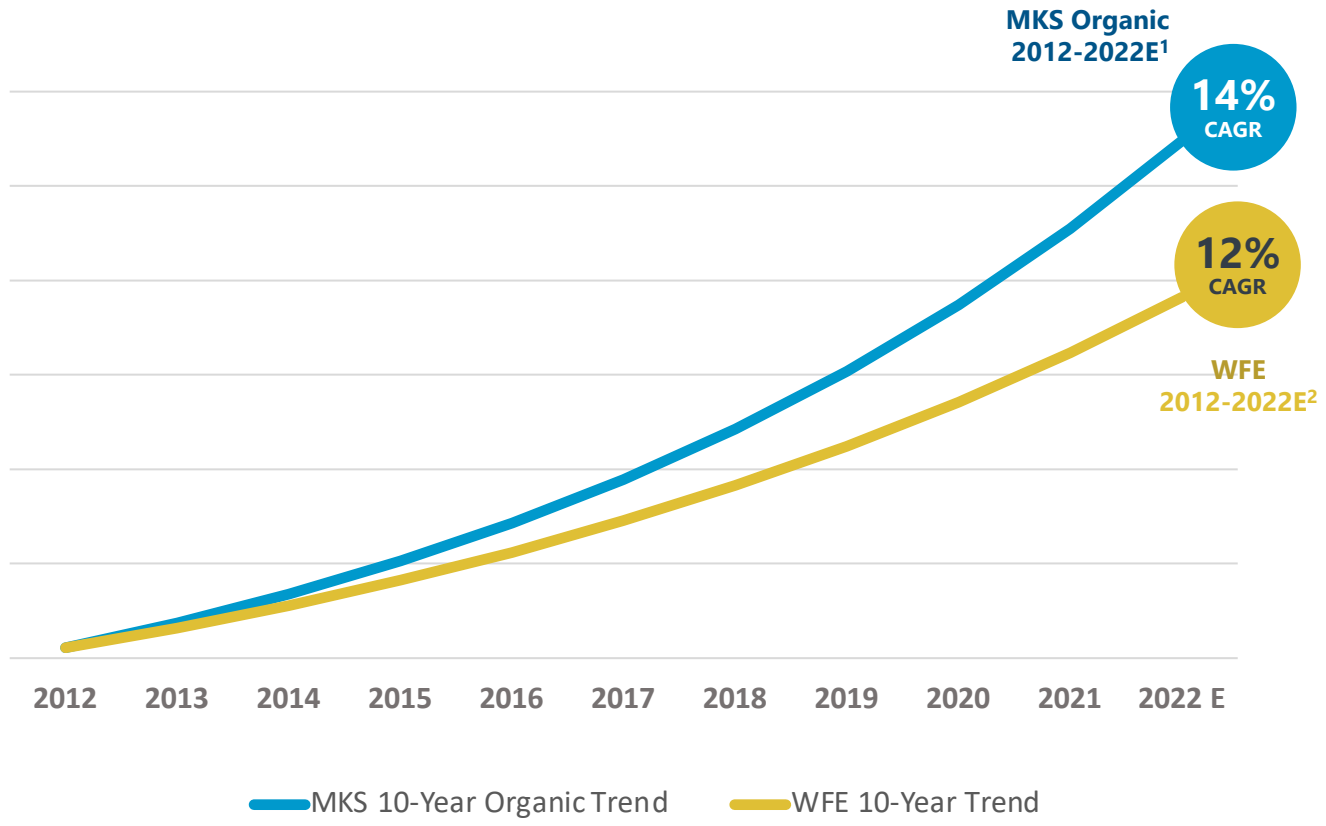
Our “Surround” Strategy is How We Execute

SEMICONDUCTOR

“Surround the Wafer℠”



MKS' Semi Business Has Outperformed WFE Over the Long-Term



REASONS WE HAVE OUTPERFORMED

1	Technology differentiation
2	Exposure to higher growth segments (vertical scaling, lithography, metrology & inspection)
3	Faster time to market
4	Operational excellence and R&D scale foster growing customer intimacy

[1] 2022E semiconductor revenue based on semiconductor revenue for the nine months ended September 30, 2022 plus management's estimate for the three months ended December 31, 2022, as provided during MKS' earnings presentation on November 3, 2022 [2] TechInsights, Internal Company estimate

Market Leader in Critical Vacuum Subsystems

Pressure & Flow Measurement & Control

MKS Baratron® products accurately measure vacuum chamber pressure, which is **critical to tool performance and yield**

Plasma & Reactive Gas

MKS provides **differentiated remote plasma sources and ozone generators** for chamber clean and on wafer processing

RF Power Supplies

MKS products are market leaders in providing **High Aspect Ratio Etch for 3D NAND** with high power, pulse monitoring and precise control

Measures vacuum pressure

>10x

more accurately than similar competitive products

Enables advanced logic fabrication at

<3nm

nodes

Enables

>50:1

aspect ratio in leading edge 3D NAND

Emerging Opportunity in Photonics Solutions

Optics & Optical Subsystems
High Performance Gratings

MKS provides world-class capabilities and solutions for lithography, inspection and metrology with **high precision optical imaging** for advanced nodes

Enables focusing light to image features that are

10 atoms

across

Precision Motion

MKS' broad portfolio provides advanced solutions for precise positioning needed for **inspection, metrology and advanced chip stacking**

Enables positioning the wafer to the precision of

<1/100th

the width of a human hair

Early Engagements → Enduring Relationships

MKS' ability to address our customers' hardest problems **enables long design & revenue cycles**

DEEP CUSTOMER ENGAGEMENT & COLLABORATION

	DESIGN	PRODUCTION	NEW OPPORTUNITIES
DEVELOPMENT CYCLE	Inflection → Development → Qualification	Copy Exact / Sole Source	Scaling → New Inflection
REVENUE CYCLE	0 - 2+ years → Self-funded	5+ years → Annuity-like Revenue Stream	

MKS DIFFERENTIATION

- **Capabilities spanning all critical steps**
- **Engaged across the semiconductor & electronics ecosystem**
- **Holistic view of emerging customer & industry challenges**

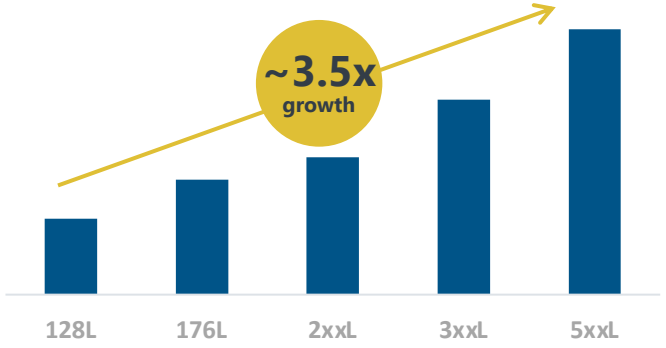
RF Power Critical to Semiconductor Etch

DIELECTRIC ETCH
Capitalizing On Leading Share[1]

- Higher aspect ratio features needed as device thickness grows, generating greater demand for RF Power in Dry Etch Processes
- Achieving increases in layer counts requires more chambers per wafer and more RF Power per chamber

ETCH TOOLS (CHAMBERS) NEEDED FOR 50K WAFERS / MONTH[1]

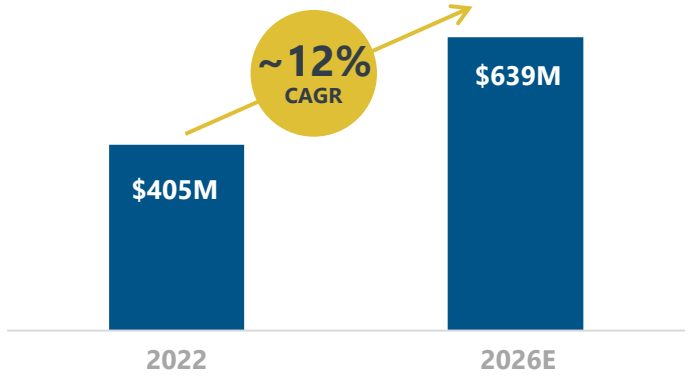
RF POWER CONTENT (kW) PER CHAMBER[2]



CONDUCTOR ETCH
Penetration Opportunity

- Widely used in Logic, DRAM and NAND
- Investments in advanced nodes in Logic and DRAM support strong CE demand

MARKET FOR RF POWER SUPPLY FOR CONDUCTOR ETCH[1]



WHY MKS WINS

- 7 generations of RF Power advancements for high aspect ratio etch
- Modular design and advanced pulsing algorithms & scale to make incremental R&D investments
- Track record of accelerated time to market

[1]TechInsights [2] Internal Company estimate

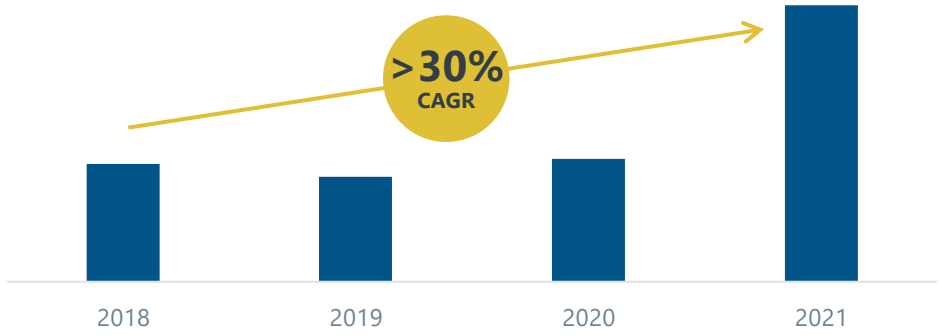
Optics and Motion Essential to Enabling Semi Roadmaps

Broad applications across Advanced Lithography, Metrology & Inspection

Optical Solutions

- Increasing optics content and complexity in WFE to reduce feature size, increase throughput and drive yields
- Applications stretch across DUV, EUV, High-NA EUV lithography, Inspection and Metrology

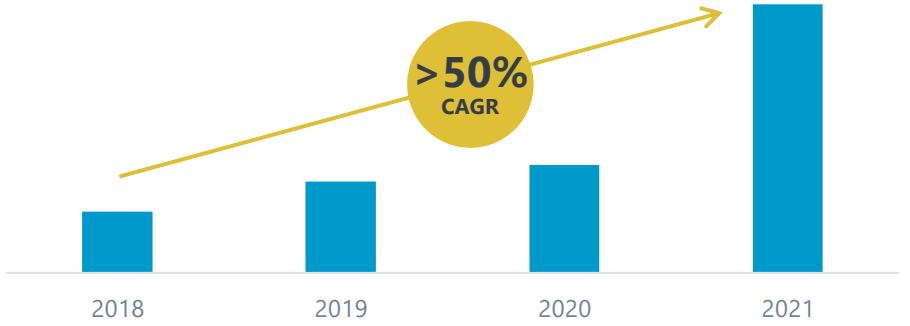
MKS SEMI OPTICAL SOLUTIONS BOOKINGS



Precision Motion

- Feature size scaling is driving requirements for precision positioning
- Chip-stacking needs for precision alignment

MKS SEMI MOTION CONTROL BOOKINGS



WHY MKS WINS

Broad range of differentiated optics capabilities across wavelengths into the EUV

Scalable capability from design to volume manufacturing in region and in low-cost countries

Proven experience, quality and reliability in WFE

MKS Solutions Positioned to Address Process Inflections

Applying **broad expertise** to today's challenges to deliver **custom-built solutions**

INFLECTION	Vertical Scaling	Horizontal Shrink	Advanced Packaging
MKS SOLUTION	**MKS RF Power, Vacuum and Optical solutions** for advanced etch and deposition	**MKS Photonics solutions (Optics, Motion) and broad Vacuum portfolio** are critical for advanced Logic and Foundry applications	**MKS Vacuum, Photonics and Materials solutions** address a wide array of packaging applications
SEMICONDUCTOR APPLICATION	3D NAND, Logic Gate All-Around (GAA) Atomic Layer Deposition and Etching (ALD and ALE)	3nm/2nm, 1a DRAM EUV and High-NA EUV	Through Silicon Via (TSV) 2.5D and 3D chip packaging

Key Messages

MKS is a leading critical solutions provider to the semiconductor industry

Attractive secular trends are driving long-term capital equipment investment

Differentiated portfolio and deep customer relationships position MKS to outperform WFE

2022 – 2027 Semiconductor Revenue Growth Target : WFE + 200 bps[1]

[1] *Long-term model based on semiconductor revenue for the nine months ended September 30, 2022 plus management's estimate for the three months ended December 31, 2022, as provided during MKS' earnings presentation on November 3, 2022, compared to 2027, and excludes the potential impact of foreign exchange rates.*

ELECTRONICS
& PACKAGING

Delivering Innovation at the Interconnect

James A. Schreiner
SVP and Chief Operating Officer
Materials Solutions Division

Harald Ahnert
VP, General Manager
Electronics, Materials Solutions Division

mks

Key Messages

Next-gen electronics require tighter integration of Semi and Advanced PCB designs

Unique combination of laser and chemistry capabilities positions MKS to Optimize the Interconnect℠

Proprietary capabilities & mix of equipment and consumables drive opportunity for market outperformance

Electronics & Packaging: Enabling Next Generation Devices

KEY ATTRIBUTES

Long design cycles, increased precision, tighter integration between chemistry solutions & laser processing

APPLICATIONS

Electronics Chemistries & Plating

- Electroless plating
- Electrolytic plating
- Surface treatment
- Surface finishing

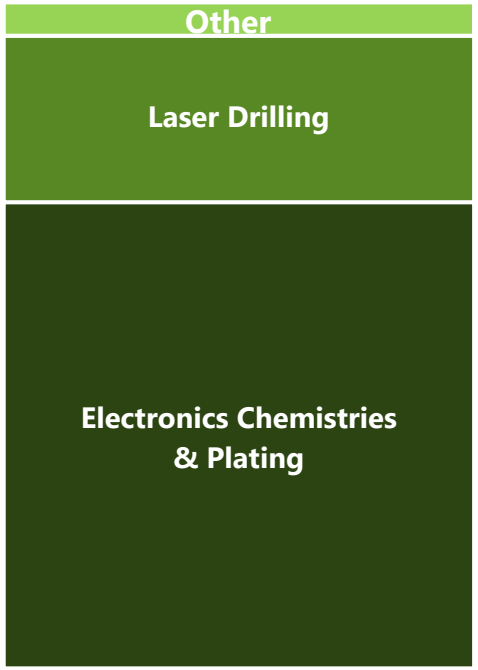
Laser Drilling

Laser via drilling for Flexible and HDI PCBs, as well as package substrates

Other

- Laser and vacuum technology for display solutions
- Testing systems for MLCCs

REVENUE MIX[1]



PRO FORMA 2021[1]: $1.3B

LEADERSHIP POSITION[2]

#1

- UV Nanosecond Pulsed Lasers
- Flex PCB Via Drilling Systems
- Electronics Plating Chemistries
- Horizontal PCB Plating Equipment

Emerging Growth Opportunities

- Integrated Solutions for Next-Gen Package Substrates, HDI & Flex PCBs
- Ultrafast UV Lasers (Picosecond and Femtosecond)

[1] See Slide 3 for additional information regarding the calculation of pro forma results of MKS and Atotech [2] Product categories where TechInsights and/or MKS estimate MKS is #1 or #2 in segment share

MKS: Built to Capitalize on Secular Trends

Semiconductor

Deposition, Etch, Lithography, Inspection / Metrology, Wet Processing

Smaller Geometries (nm)

Vertical Scaling

Novel Materials

MINIATURIZATION

COMPLEXITY

CHEMISTRY

Electronics & Packaging

Laser-based Manufacturing; Next-Gen Interconnect

Finer Features (µm)

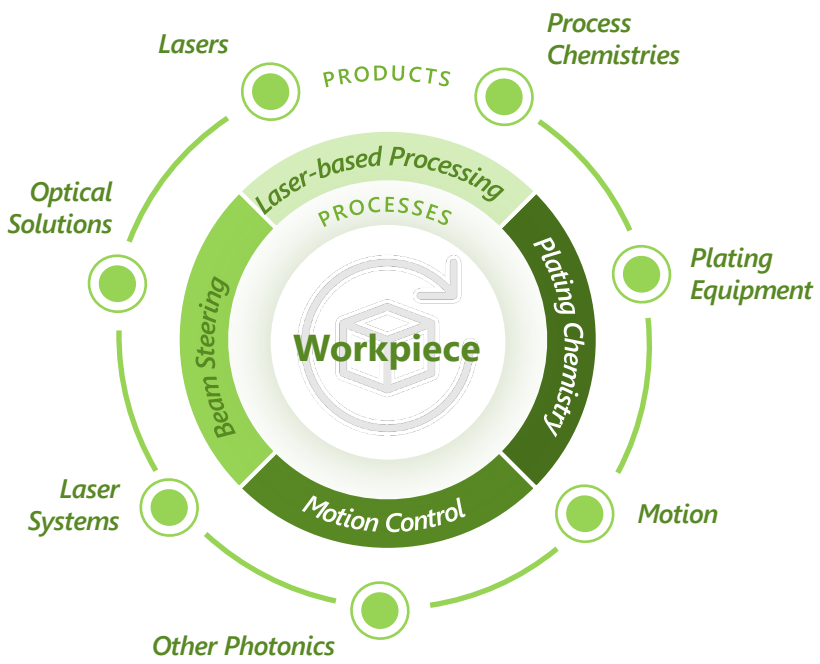
More Layers

Novel Materials

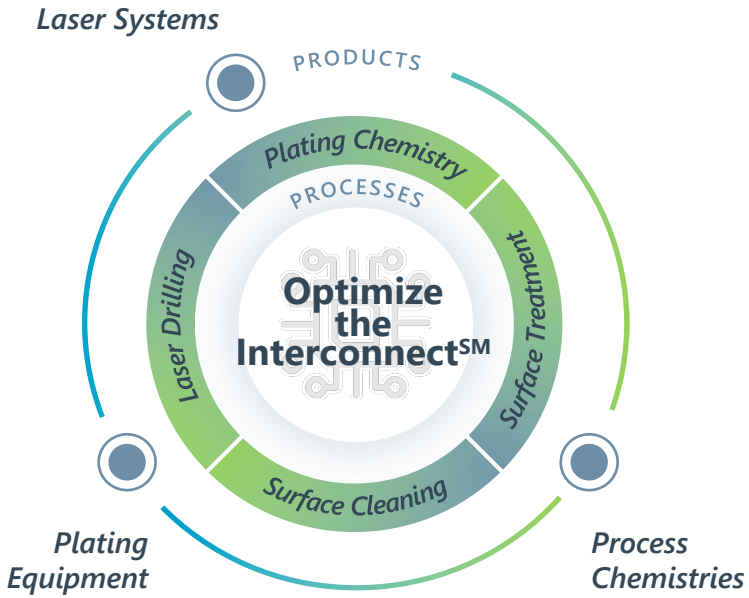
Surround The Workpiece® is Central to MKS Strategy

MKS' broad technology expertise & deep customer relationships **create a significant advantage**

1. CUSTOMER & ECOSYSTEM INTIMACY



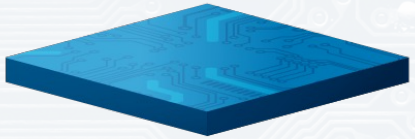
2. BROAD, INTEGRATED TECHNOLOGY

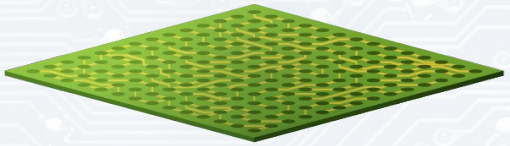


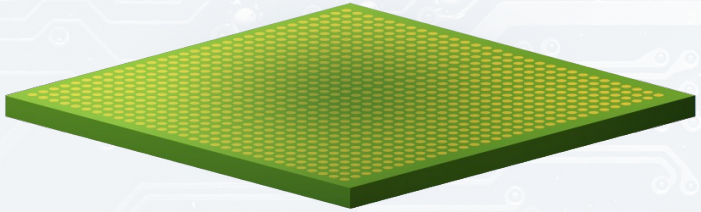
3. EXPOSURE TO HIGHER GROWTH OPPORTUNITIES

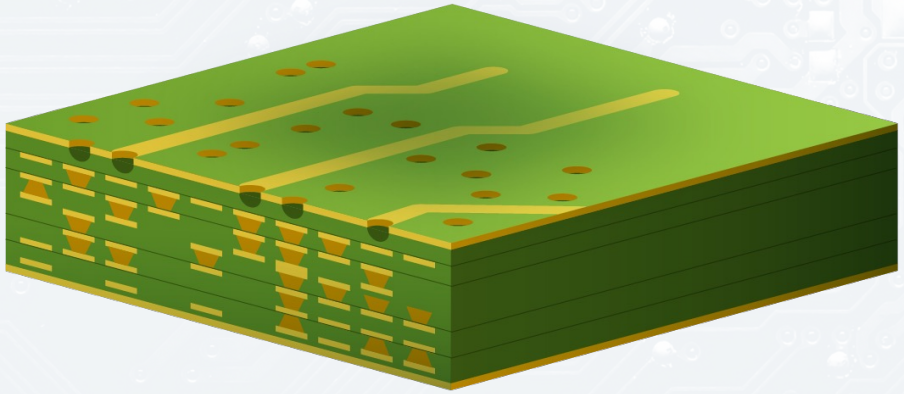
4. ENHANCED CUSTOMER YIELDS

Core Building Blocks of Advanced Electronic Devices









SEMICONDUCTOR

- Logic & Memory chips
- Nanometer (nm) scale building blocks of electronic devices

WAFER-LEVEL PACKAGING

- Redistribution layers, micropillars, bumps created directly on the chip, especially for high interconnect density applications
- Fans out nm to single-digit microns (µm)

PACKAGE SUBSTRATE

- Bridge between µm scale wafer-level packaging & PCB
- Increasing miniaturization, interconnect layer count and circuit density

PCB (STANDARD MULTI-LAYER, FLEXIBLE, HDI)

- Electrical connection platform for all electronic components
- Novel materials, increasing layer count, higher density, smaller vias, precision via plating

Electronics & Packaging Growth Drivers

High-Density Interconnect & Flexible PCB

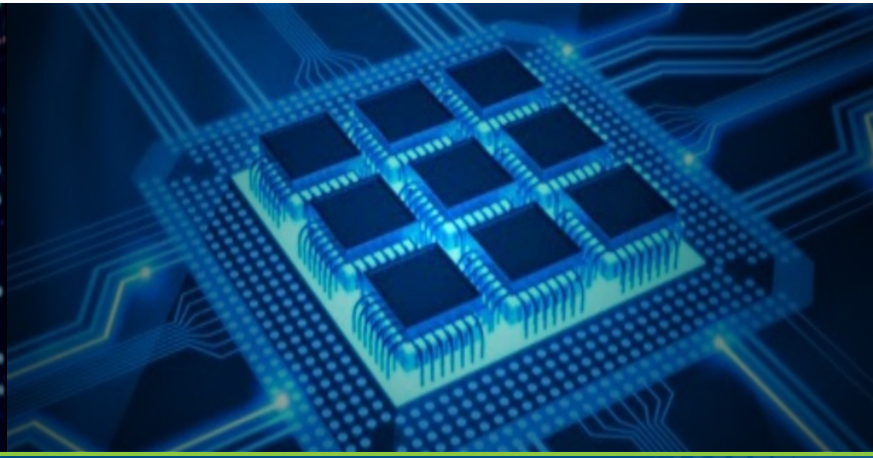
- More complex electronic device designs
- Growth in next generation electronic devices (AR/VR, wearables, ADAS for automotive, etc.)

Package Substrate

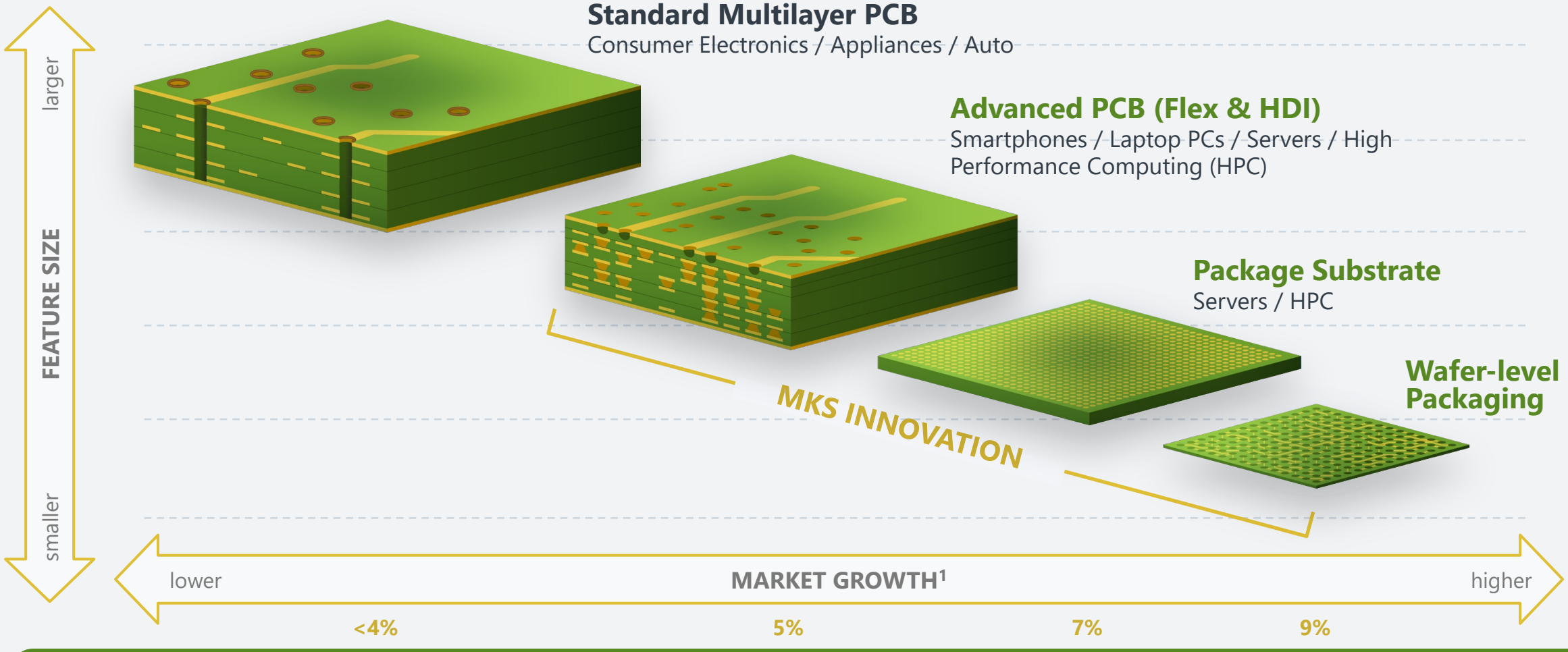
- Growing adoption of heterogenous integration / advanced packaging (Chiplets)
- Growing demand for high performance compute (A.I., Cloud Datacenters)

Wafer-Level Packaging

- Higher performance requirements and flexibility in form factor drive adoption rate
- Substantial growth in mobile space (smartphone application processors)



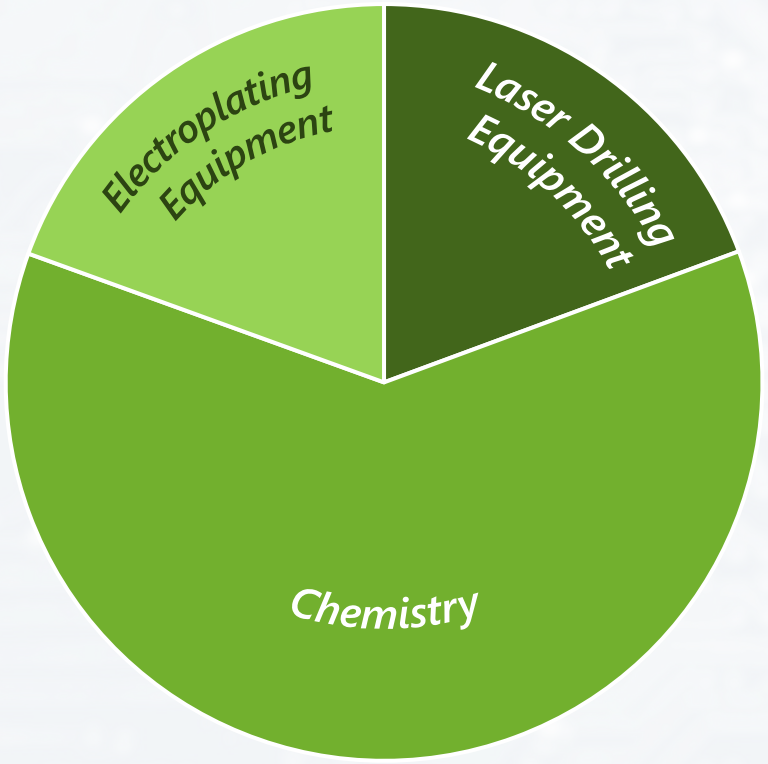
MKS Positioned for High-Value Growth Opportunities



MKS' growth powered by exposure to attractive secular trends & market share gains

[1] *Internal Company estimate*

Share Gain Potential in a Large SAM



~$5B
2022 SAM[1]

Drivers of MKS Growth in Electronics & Packaging Market

Unique combination of Laser Drilling and Electroplating provides share gain potential

Cross-sell synergy in HDI and Flex PCB

Exposure to fast-growing areas within Electronics

[1] *Internal Company estimate*

The Demands of the Connected World Are Accelerating

From the transistors on a chip, to the interconnects on a circuit board — **MKS is a key enabler**

DIGITAL DEVICE PROLIFERATION

Exploding Demand for **Electronic Devices** + **Growth in Applications** (IoT, AR/VR, etc.) =

+

PRECISION ENABLES PERFORMANCE

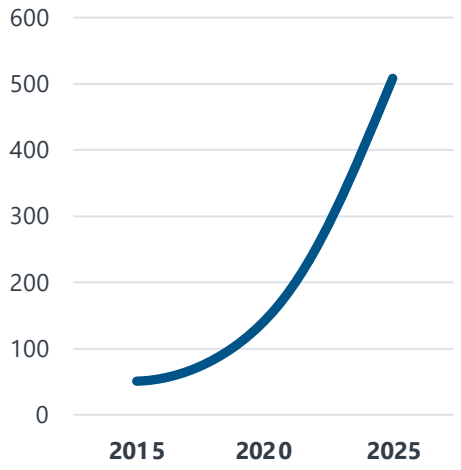
More **Power & Performance** + **Smaller** Form Factors + **Lower Cost** =

“Semi-like” Trends Extending into Next-Generation PCBs

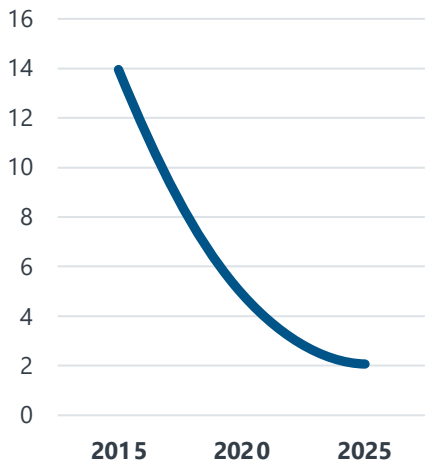
Semiconductor

Transistor density and scaling are critical to performance, cost and new form factors of electronic devices

3D NAND LAYER COUNT



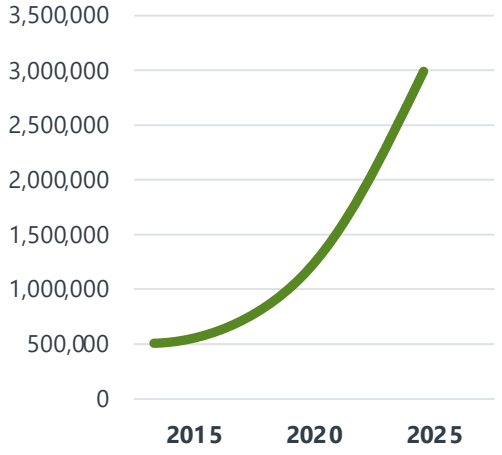
ADVANCED LOGIC TRANSISTOR (Node Size, in nm)



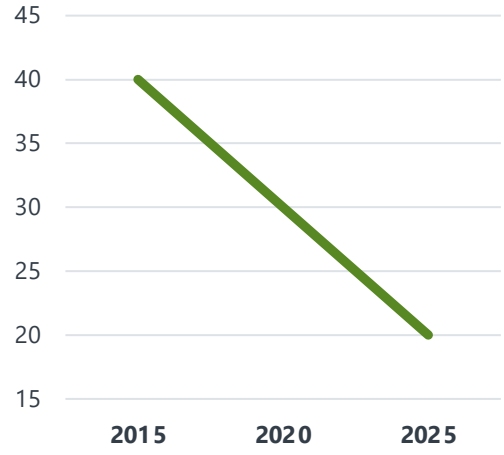
Advanced PCB

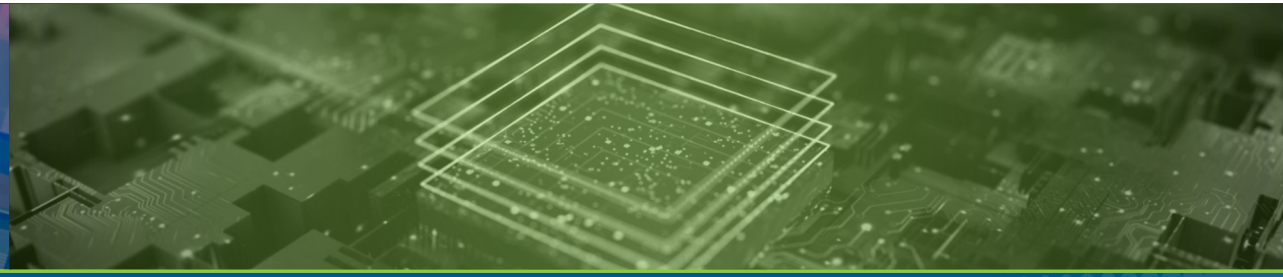
Interconnect density and smaller line/space are critical to performance, cost and new form factors of electronic devices

AVG. VIAS /PANEL LAYER



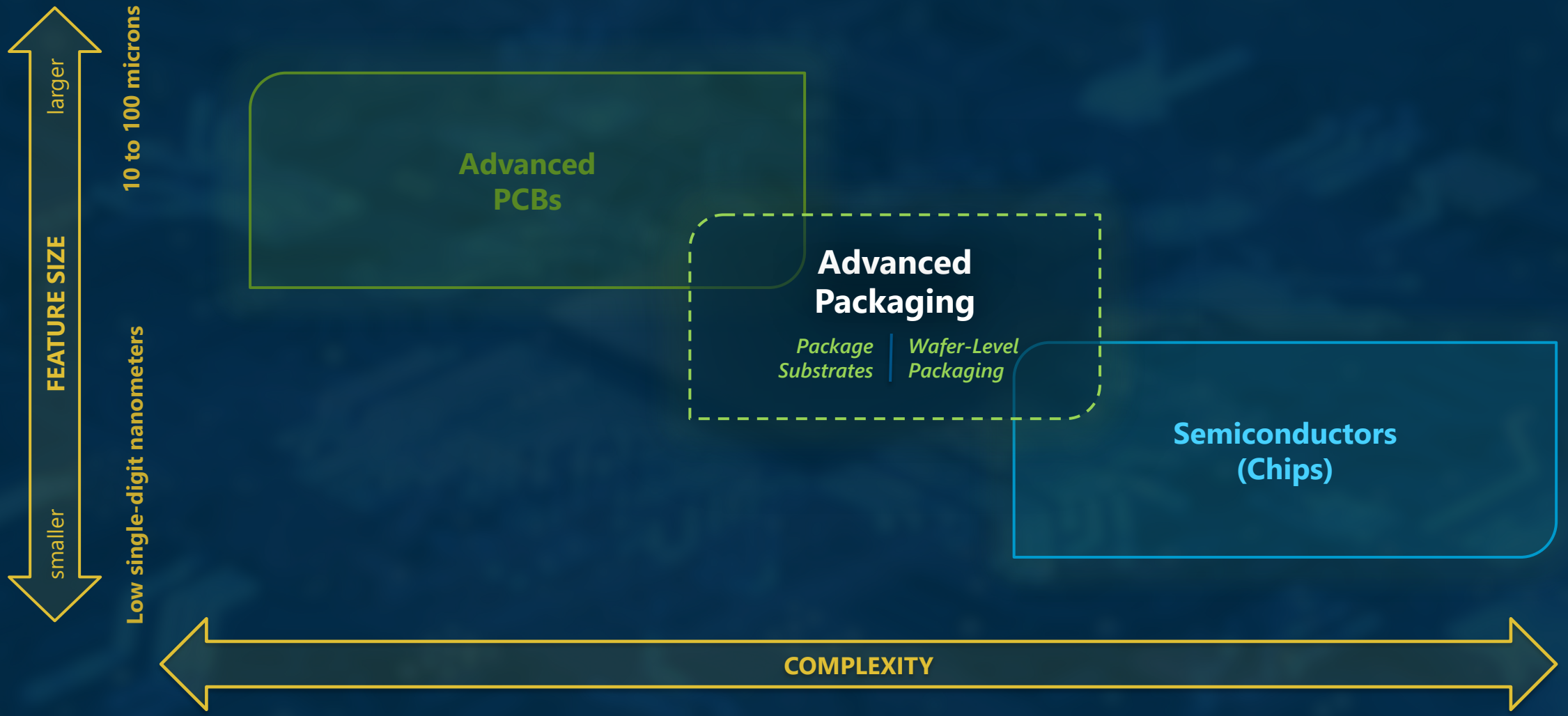
HDI LINE/SPACE (in µm)





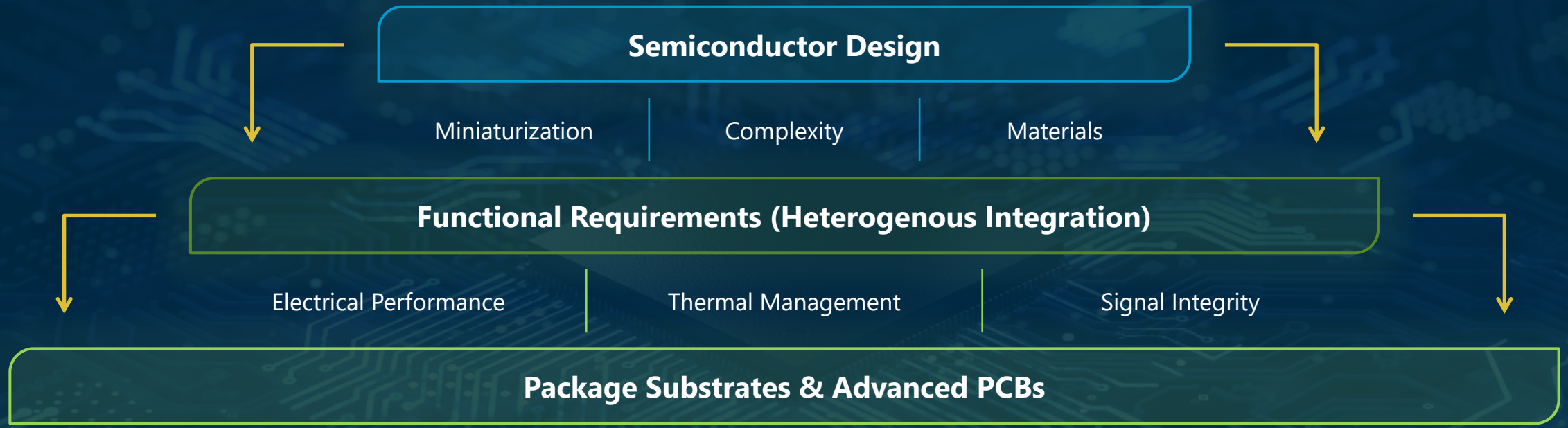
Source: Internal Company estimate

Lines Are Blurring as Complexity Increases …



…Requiring Increasingly Integrated Semi, Substrate & PCB Design

MKS creates processes and products that **optimize yields and enable faster time to market**



Structures

- Flex & Rigid-Flex
- HDI
- Substrate-like PCB
- Package Substrate

Materials

- Ajinomoto Build-up Film (ABF)
- Resin Coated Copper (RCC)
- High Frequency (HF)
- Flame Retardant (FR4)
- Bismaleimide Triazine (BT)

Via Formation

- Geometry
- Diameter/Aspect Ratio
- Cu clad / filling

Process Chemistry

- Adhesion promotion / bonding
- Stripping / etching
- Laser direct drilling pretreatment
- Desmear
- Electroless/Electrolytic Plating
- Surface Finishing

Growing Content Opportunity

VAUE DRIVERS

HDI & Flex PCB

- ~15% area increase for HDI logic board
- Via density >2x from HDI to Substrate-like PCB (SLP)
- New components for 5G functionality
- Increasing number of flex PCBs for high-end phones

>15% increase
in PCB $ content per smartphone[1]

[1] Wet chemistry value increase from 4G phone to 5G phone, per internal company estimate

Package Substrate

- Larger multi-die substrate
- Increased Package Substrate layer counts
- New content: Ultrafine pitch bridge
- Via density increase >3x

>2x increase
Package Substrate $ content per Advanced Package[2]

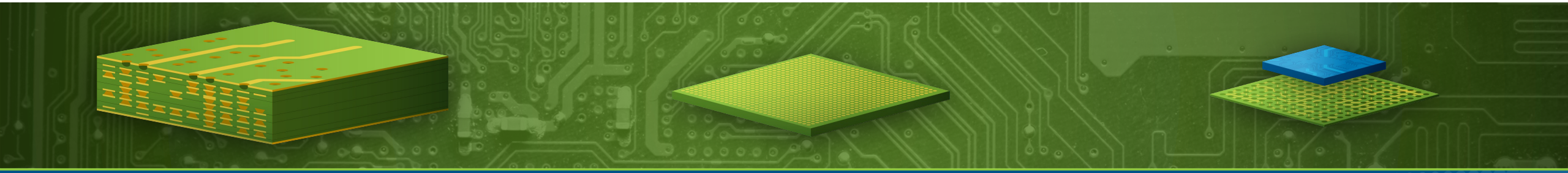
[2] High-end Flip Chip Ball Grid Array (FCBGA) 2015 vs. High-end FCBGA 2022, per internal company estimate

Wafer-Level Packaging

Increasing adoption of Fan Out Wafer-Level Packaging (WLP) in mobile space and high performance computing

>10% increase
$ Chemistry value per year[3]

[3] Based on Prismark Partners LLC report for unit forecast for mid and high-end Fan Out WLP 21'-26'



Optimize the Interconnect℠

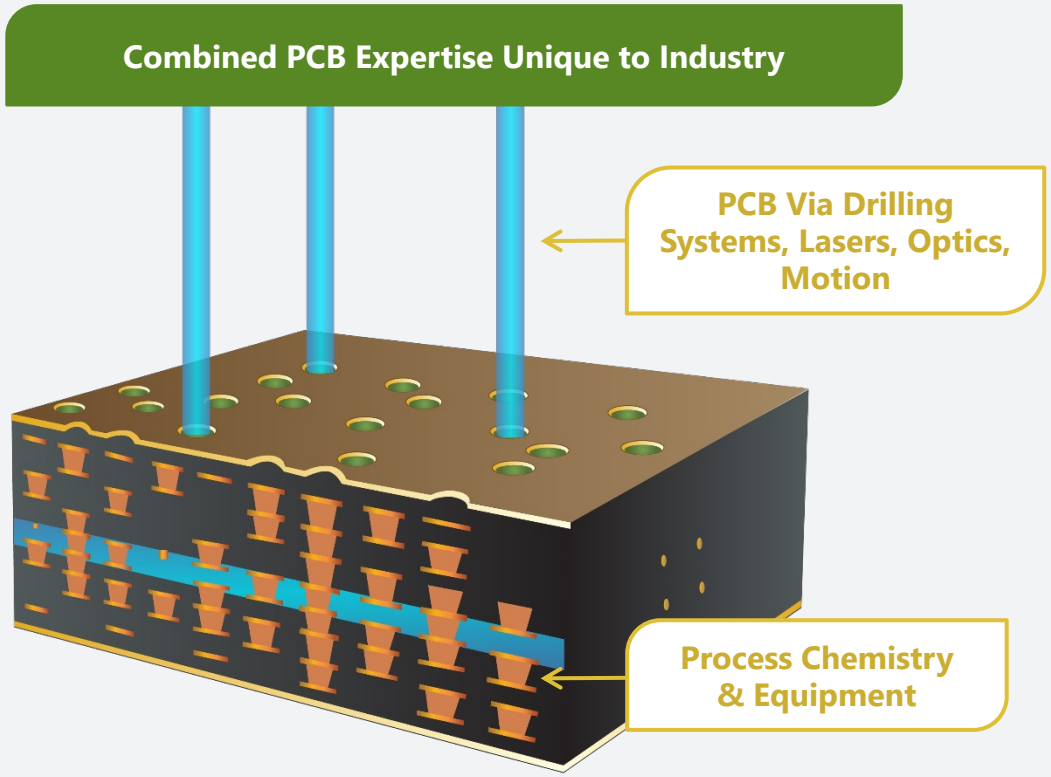
Harald Ahnert

VP, General Manager

Electronics, Materials Solutions Division

The Next Frontier: Optimize the Interconnect[SM]

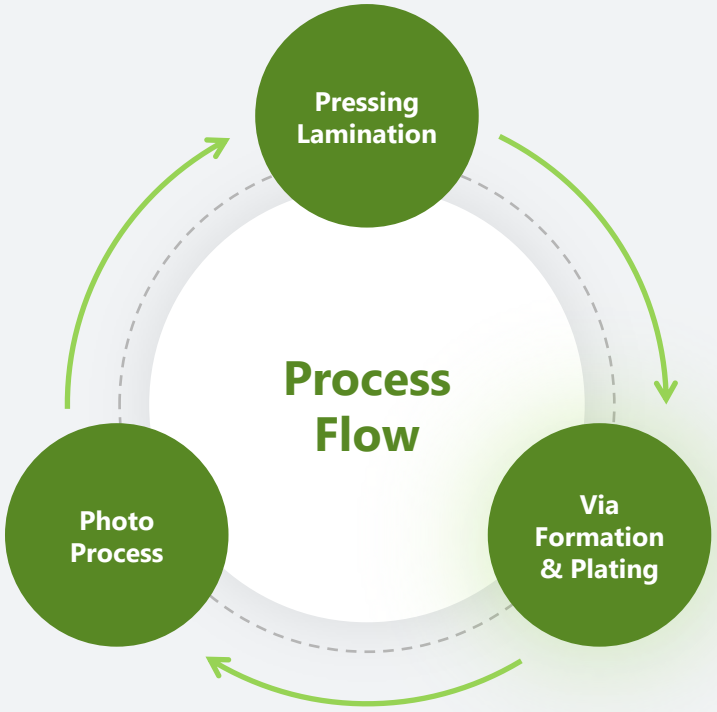
Combination of optimized laser drilling & process chemistries expertise positions MKS to deliver better yields, faster for customers



MKS is uniquely positioned to solve the emerging challenges at the Interconnect

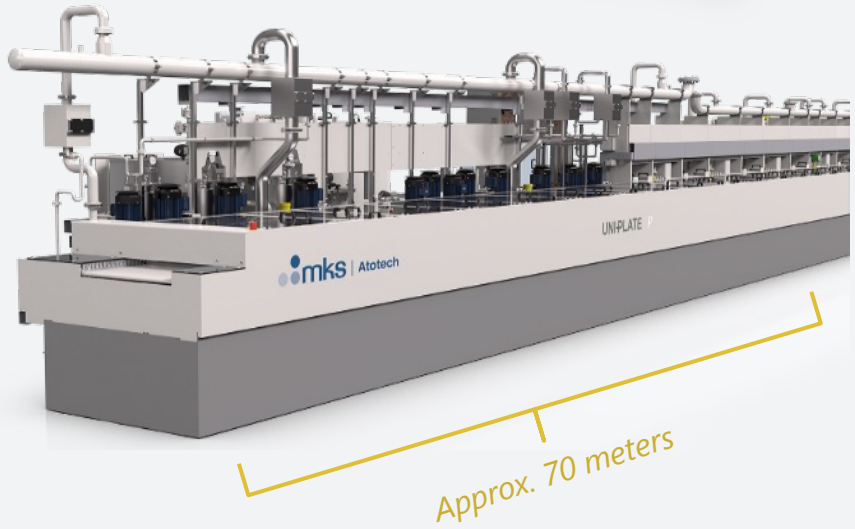
Complete Via Formation & Chemistry Process

Combined expertise offers customers the **first integrated approach to solving a variety of complex Advanced PCB & Package Substrate manufacturing requirements**



Critical Process Steps per Layer

- LDD Pretreatment
- Laser Drilling
- Splash Removal
- Desmear
- Electroless Copper
- Electrolytic Copper



Optimize the Interconnect^{SM}: Thermal Management

The combination of MKS' laser drilling & chemistry capabilities offers customers the **first integrated approach to improve thermal dissipation**

PROBLEM

Thermal dissipation

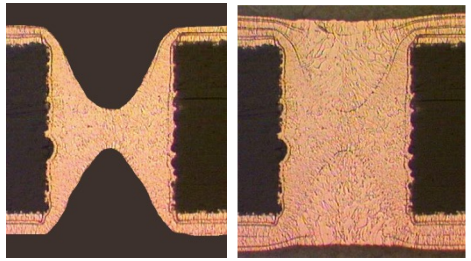
- Advanced semiconductors have greater power density, creating more heat
- Heat sink capability limited by total Cu surface area

MKS SOLUTION

Optimized interconnect geometries with advanced copper plating

- MKS laser beam-steering technology enables geometric flexibility for innovative designs
- Advanced copper filling of vias and through-holes by leading MKS equipment and chemical processes

Flexibility in via / through-hole shape enabled by MKS laser technology



1st step: Bridge *2nd step: Fill*

Void-free copper filling technology enabled by MKS systems offering

Optimize the Interconnect℠: Electrical Performance

> The combination of MKS' laser drilling and chemistry capabilities offers customers the **first integrated approach for higher circuit density**

PROBLEM

Circuit Density

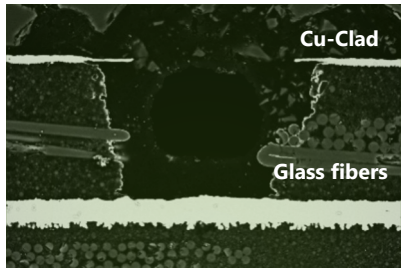
- Higher circuit density enabled by smaller conductor width and via sizes
- Yield and reliability of the entire package becomes a challenge

MKS SOLUTION

Redefining the limits by optimized process interactions

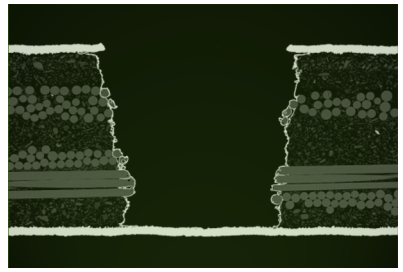
- Optimized interaction between MKS adhesion promoters, laser drilling systems and desmear/copper plating solutions
- Lower copper surface thickness and corresponding lower etching depth for circuit formation enable finer lines and spaces

Process parameters not optimized



Poor copper coverage driven by Cu-clad overhang and strong glass fiber protrusion

Optimized laser drilling, desmear & electroless copper processes



Optimized via shape enabling subsequent copper metallization

Optimize the Interconnect[SM]: Signal Integrity

The combination of MKS' laser drilling and chemistry capabilities offers customers the **first integrated approach to reduce signal interference**

PROBLEM

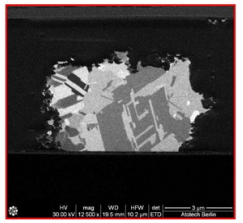
Signal Interference

- Total copper volume in a circuit will determine the signal integrity, particularly for high bandwidth applications
- Electrical current flows mainly at the outer surface of a conductor ("skin effect")

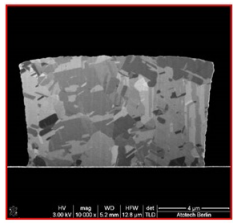
MKS SOLUTION

Multiple via sizes and reduced surface roughness of features

- Advanced via drilling enables optimized via diameters
- MKS chemistry solutions enable smoother conductor surfaces while maintaining sufficient copper-dielectric adhesion



Surface roughness contributes to signal interference



Smooth conductor shape for better signal integrity

Optimize the Interconnect[SM]: Time to Market

The combination of MKS' laser drilling and chemistry capabilities offers customers **quicker development cycles for new products & materials**

PROBLEM

Lengthy Analysis Cycle of New Products

- Average HDI product analysis cycle: ~3 months
- Drilling and Chemistry: separate vendors, processes, locations
- Significant time for shipping logistics of test piece
- Significant time for independent inspection/analysis

MKS SOLUTION

Accelerate Development and Analysis

- Significantly reduce product analysis cycle: 1 month
- Drilling and Chemistry in same house
- Onsite metrology capabilities
- Integrated solutions between processes

Bringing The Whole "Package"

Deep collaboration & long customer engagement cycles create incumbency, LT revenue visibility

UNMATCHED CUSTOMER AND ECOSYSTEM INTIMACY

Component Suppliers

- PCBs
- Package Substrates
- Semiconductors
- Connectors/lead frames
- Metal plating

OEMs

- Smartphones
- 5G infrastructure
- Consumer electronics
- Computing
- Servers/Data storage
- Automotive

BROADEST EXPERTISE; COMPREHENSIVE APPROACH

Core Competencies

Chemistry

Lasers

Customized equipment

Global service

Software

INTEGRATED CONSUMABLES BUSINESS MODEL

~50%

of MKS PCB related chemistry sales driven by MKS equipment[1]

>85%

of MKS equipment installed base uses MKS chemistry[1]

MKS DNA

MKS Differentiation

[1] *Internal Company estimate based on 2021 Atotech revenue. Equipment refers to PCB and Package Substrate Plating Equipment*

Key Messages

Next-gen electronics require tighter integration of Semi and Advanced PCB designs

Unique combination of laser and chemistry capabilities positions MKS to Optimize the Interconnect℠

Proprietary capabilities & mix of equipment and consumables drive opportunity for market outperformance

2022 – 2027 Electronics & Packaging Revenue Growth Target : GDP + 300 bps[1]

[1] *Long-term model based on pro forma electronics & packaging revenue of MKS and Atotech through September 30, 2022, plus management's estimate for the three months ended December 31, 2022 based on expected end-market breakdown of total revenue, compared to 2027, and excludes the potential impact of changes in palladium prices, which are passed through to customers, and foreign exchange rates.*

15-minute break

SPECIALTY INDUSTRIAL

Adding Value Through Proprietary Technologies

Mark M. Gitin, PhD
SVP, General Manager
Photonics Solutions Division

Gertjan van der Wal
VP, General Manager
General Metal Finishing,
Materials Solutions Division

mks

Key Messages

Leading market positions that leverage our domain expertise and proprietary technologies

Broad end market exposure characterized by deep customer relationships

Resilient businesses with attractive cash flow and margins

Specialty Industrial: Harnessing Core Expertise Across Markets

KEY ATTRIBUTES

Differentiated technologies that solves specific needs for customers

APPLICATIONS

Industrial

- Vacuum solutions for synthetic diamond and solar manufacturing
- Functional coatings for corrosion and wear resistance
- Decorative surface finishing

Life & Health Sciences

- Optics and photonics for analytical instrumentation
- Lasers for ophthalmic surgery
- Vacuum solutions for medical equipment sterilization

Research & Defense

- Vacuum and photonics solutions for advanced research and quantum computing
- Lasers and photonics for remote sensing

REVENUE MIX

PRO FORMA 2021[1]: $1.3B

LEADERSHIP POSITION[2]

#1

- Laser Measurement Instruments
- Vibration Control
- High Performance Gratings
- Decorative Surface Finishing

#2

- Functional Coatings for Corrosion & Wear Resistance
- IR Optics
- Opto-Mechanics
- Component Test

[1] See Slide 3 for additional information regarding the calculation of pro forma results of MKS and Atotech [2] Product categories where TechInsights and/or MKS estimate MKS is #1 or #2 in segment share

Research & Defense

Advanced Research

MKS ENABLES:

Development of new materials and fabrication techniques, space science, and satellite imaging and communications

Remote Sensing

MKS ENABLES:

Precision, long-range measurement and mapping of chemical & physical traits of objects and terrain

Quantum Computing

MKS ENABLES:

Advanced quantum computing research aimed at making today's computers millions of times faster

Life & Health Sciences

Ophthalmic Surgery

MKS ENABLES:

Lasik eye surgery and cataract surgery using lasers

Medical Diagnostics

MKS ENABLES:

Precision, high-throughput molecular analysis and manipulation of biological samples for medical clinics and life sciences

Neuroscience Imaging

MKS ENABLES:

Research of neurodegenerative diseases by observing billions of connections with 3D video in a live animal brain

Industrial

General Metal Finishing

MKS ENABLES:

Decorative and functional surface finishing for automotive and industrial applications

Solar

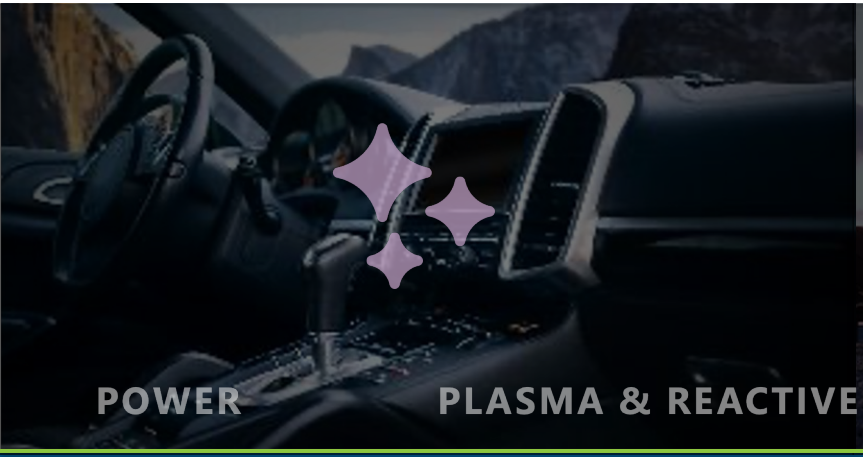
MKS ENABLES:

Manufacturing of solar panels using advanced lasers and proprietary chemistries

Synthetic Diamonds

MKS ENABLES:

Manufacturing of diamonds for jewelry and industrial applications using microwave generators



Applying Our Vacuum Expertise to New Markets

Acquired Alter in 2013 as part of Surround the Chamber® strategy for the Semiconductor market

Microwave Power for Chemical Vapor Deposition

Acquired for $2.4M, was at $2.5M revenue run rate

Key enabler of Synthetic Diamond manufacturing

Leveraging Alter IP for future Semiconductor applications

Current revenue run rate of $24M

MKS' Differentiated Capabilities are Increasingly Recognized Outside of Semiconductor and Electronics & Packaging

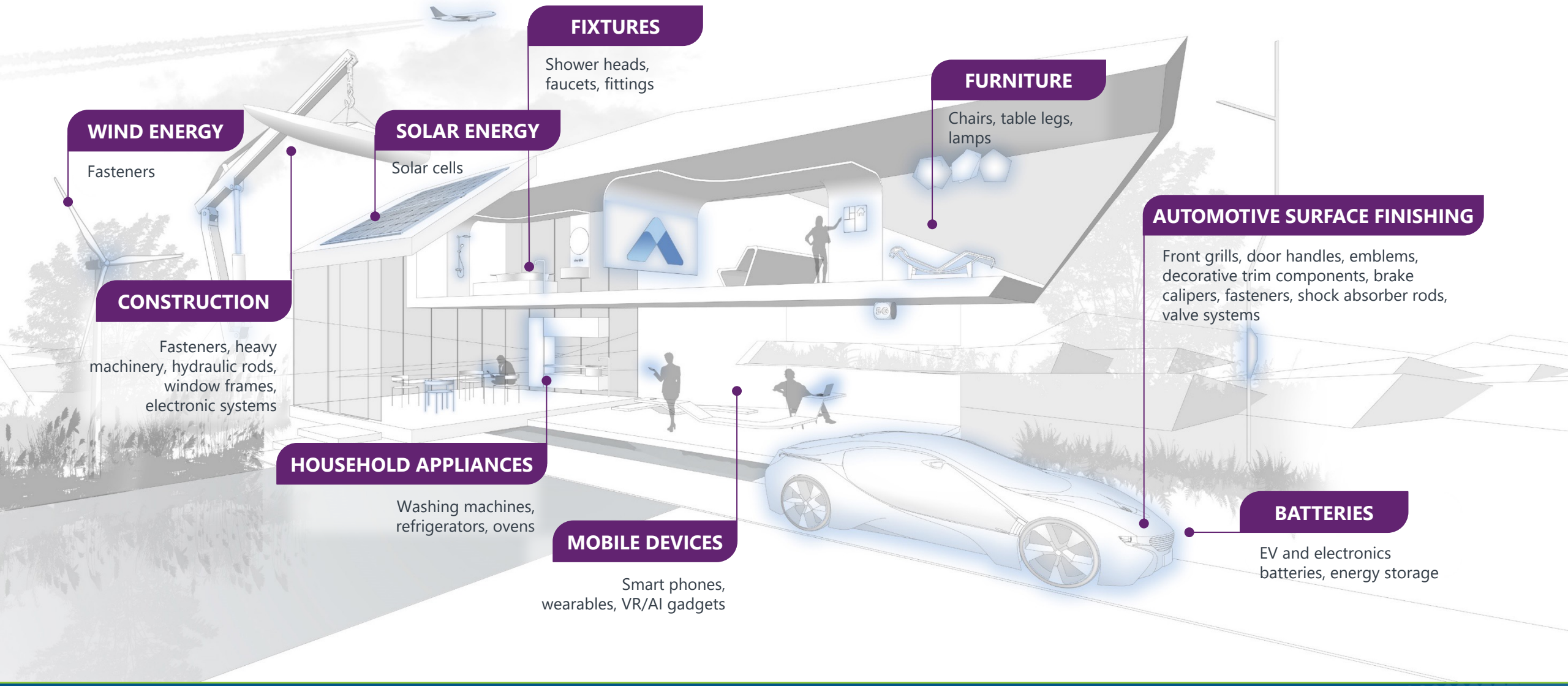
General Metal Finishing

Gertjan van der Wal

VP, General Manager

General Metal Finishing,
Materials Solutions Division

GMF Solutions are Critical to Products Integral to Everyday Life



FIXTURES

Shower heads, faucets, fittings

FURNITURE

Chairs, table legs, lamps

WIND ENERGY

Fasteners

SOLAR ENERGY

Solar cells

AUTOMOTIVE SURFACE FINISHING

Front grills, door handles, emblems, decorative trim components, brake calipers, fasteners, shock absorber rods, valve systems

CONSTRUCTION

Fasteners, heavy machinery, hydraulic rods, window frames, electronic systems

HOUSEHOLD APPLIANCES

Washing machines, refrigerators, ovens

MOBILE DEVICES

Smart phones, wearables, VR/AI gadgets

BATTERIES

EV and electronics batteries, energy storage

Industrial: Technology & Market Leadership in Surface Finishing

GMF is a leading global supplier of functional and decorative surface finishes serving a broad array of end markets and applications

GLOBAL

>6,600

customers in 40 countries

MARKET LEADER

#2

globally with >20% share[1]

KEY DIFFERENTIATOR

Comprehensive integrated solutions provider with a wide range of surface finishing chemistry and equipment as well as a world-class global service presence

EMBEDDED RELATIONSHIPS

49

R&D/laboratory sites worldwide; Integrated chemistry and equipment

SUSTAINABLE INNOVATOR

>670

active registered patents underline commitment to technology leadership

[1] *Internal Company estimate*

GMF Well-Positioned for Attractive Secular Trends

REPLACEMENT OF HARMFUL SUBSTANCES

- Driven by strict environmental regulations
- Cr(VI)-free decorative and functional chrome plating

REDUCED RESOURCE CONSUMPTION

- Tighter global operating requirements
- Demand for reduced resource consumption (water, energy, chemistry)

RENEWABLE ENERGY

- Cost-efficient solutions for solar cell production
- Demand for highest corrosion protection for offshore and onshore wind turbines

ELECTRIFICATION, BATTERIES & LIGHTWEIGHTING

- Enhanced plating of new plastics and lightweight metals
- New material combinations requiring advanced corrosion protection
- Electric vehicle battery applications

PREMIUMIZATION

- Increasing quality and durability requirements
- Demand for new chrome colors

MOBILITY

- Plating of new plastics for 5G antennas
- Non-magnetic coatings for camera housings

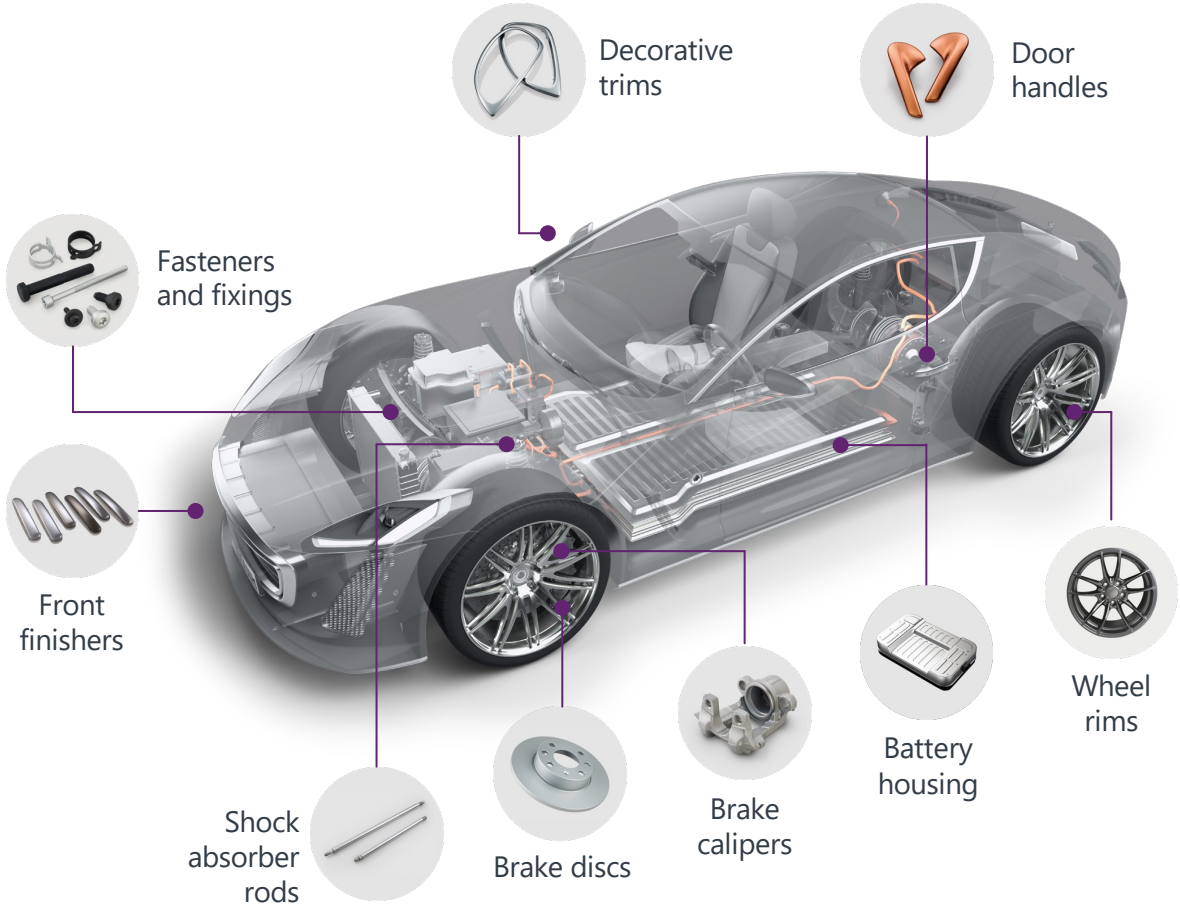
Auto Market Comprises >50% of our GMF business

EV Growth Creates Value-Add Opportunities for GMF

TRANSITIONING PARTS

ICE Powertrain Related Components

- Engine valves
- Fuel injector lines
- Fuel injection pump
- Turbo wheels
- Front grills



EMERGING PARTS

Electric Drivetrain Components

- Battery housings
- Lead tabs
- Bus bars
- Battery terminals
- Fasteners — electrical conductivity
- IGBT heat sinks
- Chargers

More and Higher Value Surface Finishing

- More surface area (thicker shock rods, more scrolls)
- Eco-friendly surface finishing solutions
- New materials requirements

>1.5x GMF Chemistry Content[1] in EV than ICE

[1] *Internal Company estimate; does not include incremental Electronics and Semiconductor content*

GMF at Forefront of Emerging Sustainability Requirements

Pioneering greener chemistry driven by tighter regulatory standards & customer sustainability needs

MKS is well-positioned to drive adoption of sustainable alternatives

Boric acid free
Cadmium free
Cobalt free
Cyanide free
Cr(VI) free
Formaldehyde free
Fluorine free
Nickel free
NPE free
NMP free
PFAS free
Lead free

EXAMPLE
Cr(VI) Replacement

Full portfolio of sustainable decorative and functional chrome plating processes — Covertron®, TriChrome®, BluCr®

Substances highlighted in yellow are also relevant for Electronics & Packaging

Why MKS Wins in General Metal Finishing

Global Footprint and Localized Customer Service

Supports customer across the entire plating process

Technology Leader

More than 140 R&D professionals proactively addressing increased sustainability needs and technical requirements

Systems Approach

Co-optimization of chemistry and equipment drives high customer yield, reduced waste and lower costs, resulting in higher customer intimacy and stickiness

Localized Service and R&D Support are Unmatched

49 laboratory sites around the world

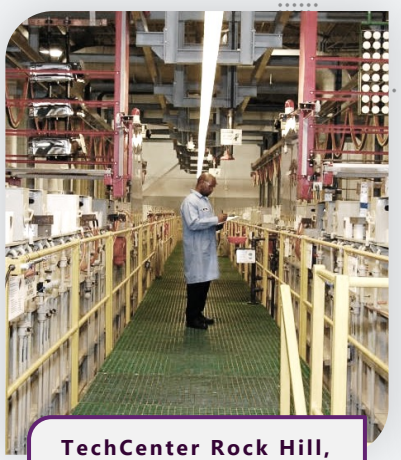
- TechCenter and R&D support
- Customer service
- Quality control

Chemistry Services

- Process control with regular analysis of the bath
- Analyze samples, electrolytes and wastewater using state-of-the-art measurement equipment
- Determine elements and organic additives with spectroscopic and electrochemical methods and ion chromatography

Materials Science Services

- Inspect samples with highly sophisticated microscopes
- Determine layer thickness, crystal structures, and surface roughness
- Investigate mechanical properties like hardness, peel strength, ductility and CoF
- Perform corrosion testing according to a variety of standards



TechCenter Rock Hill, South Carolina

TechCenter Trebur, Germany

TechCenter, Gurgaon, India

Key Messages

Leading market positions that leverage our domain expertise and proprietary technologies

Broad end market exposure characterized by deep customer relationships

Resilient businesses with attractive cash flow and margins

2022 – 2027 Specialty Industrial Revenue Growth Target : GDP+[1]

[1] *Long-term model based on pro forma specialty industrial revenue of MKS and Atotech through September 30, 2022, plus management's estimate for the three months ended December 31, 2022 based on expected end-market breakdown of total revenue, compared to 2027, and excludes the potential impact of changes in palladium prices, which are passed through to customers, and foreign exchange rates.*

FINANCE

Foundation for Long-Term Value Creation

Seth H. Bagshaw
SVP, Chief Financial Officer & Treasurer

mks

Key Messages

Strategic evolution into broad-based foundational solutions provider

Strong profitability profile, with attractive earnings growth track record

Capital allocation strategy rooted in long-term value creation

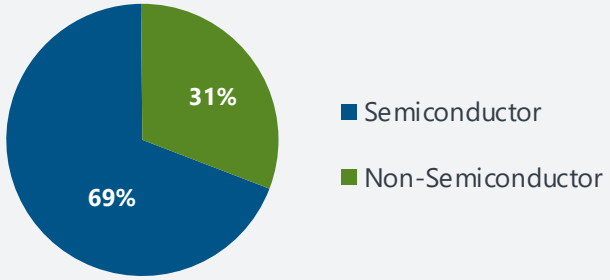
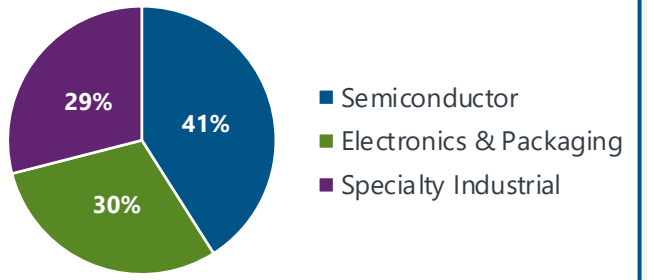
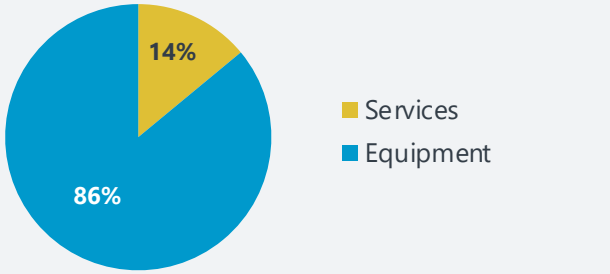
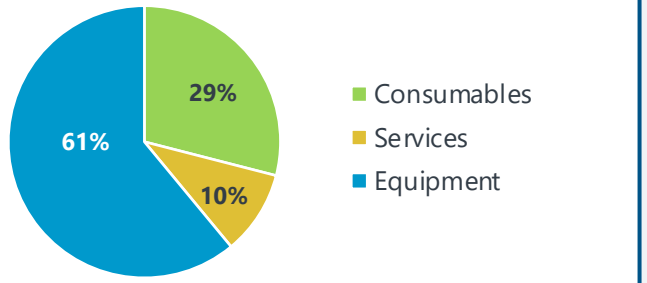
Strong Growth and Financial Profile

	2015	2021 PRO FORMA[1]
TOTAL REVENUE	$0.8B	$4.4B
NON-GAAP GROSS MARGIN	44%	48%
ADJUSTED EBITDA MARGIN	24%	29%
ADJUSTED EBITDA	$0.2B	$1.3B

[1] *See Slide 3 for additional information regarding the calculation of pro forma results of MKS and Atotech.*

Significant Evolution Since 2015

More balanced end-market exposure with **higher mix of consumables & services revenue**

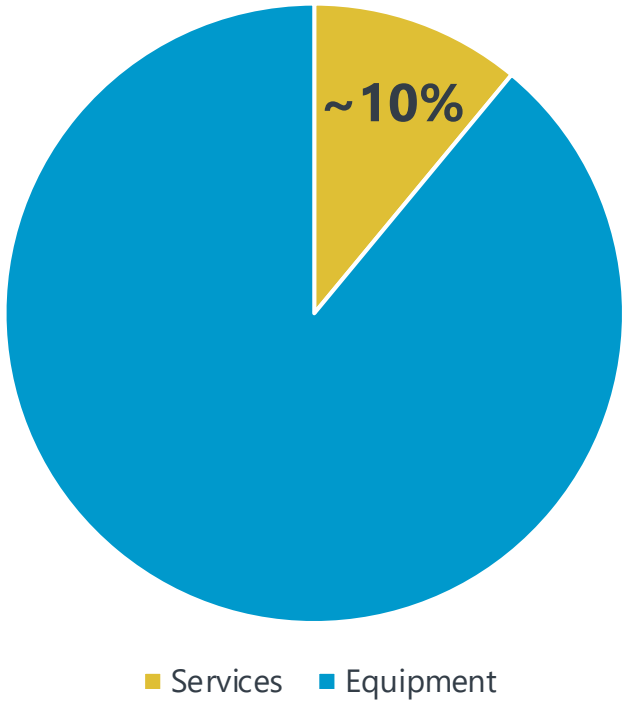
	2015	2021 Pro Forma[1]
REVENUE BY END MARKET		
REVENUE STREAMS		
TOP 5 CUSTOMER CONCENTRATION	42%	27%

[1] *See Slide 3 for additional information regarding the calculation of pro forma results of MKS and Atotech.*

Balanced Revenue Mix Drives Greater Gross Profit Stability

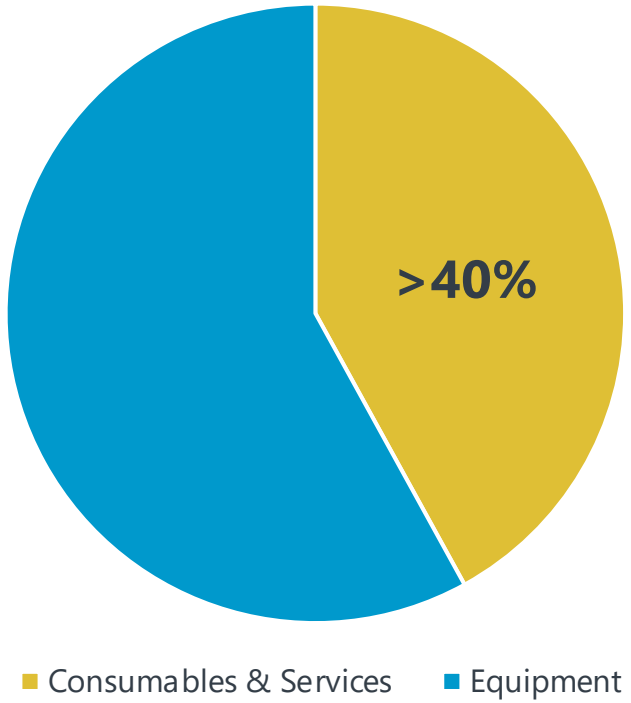
2015

% OF GROSS PROFIT BY REVENUE STREAM



2021 Pro Forma[1]

% OF GROSS PROFIT BY REVENUE STREAM



Meaningful Portion of Gross Profit Driven by Consumables & Services

[1] *See Slide 3 for additional information regarding the calculation of pro forma results of MKS and Atotech.*

Levered to Attractive End Markets

Technology leadership and differentiation **position MKS for outperformance**

Semiconductor

Critical solutions provider for semiconductor manufacturing

- Increasing demand and manufacturing complexity drive strong customer investment
- Long-term, deep relationships with consolidated customer base

GROWTH PROFILE[1]

MKS GROWTH | **WFE + 200 BPS**

Electronics & Packaging

Foundational enabler of next-generation electronic devices

- Uniquely positioned with chemistry and photonics expertise
- Long-term, deep customer relationships
- Early innings of market penetration

GROWTH PROFILE[1]

MKS GROWTH | **GDP + 300 BPS**

Specialty Industrial

Extending MKS expertise across broad end markets

- Leadership positions
- Differentiated technology
- Exposure across diverse set of applications

GROWTH PROFILE[1]

MKS GROWTH | **GDP+**

[1] Growth projection based on five-year model from 2022 to 2027. See Slides 43, 66 and 83 for additional information regarding the calculation of the growth profile for Semiconductor, Electronics & Packaging, and Specialty Industrial, respectively.

Broad Portfolio of Market-Leading Solutions

Surround the Wafer℠

Surround the Workpiece® + Optimize the Interconnect℠

VACUUM				PHOTONICS						MATERIALS	
#1 Pressure & Flow Measurement & Control	#1 Plasma & Reactive Gas	#2 FTIR Gas Analysis	#1 RF Power Supplies	#1 Optical Fiber Thermometry	#1 Flex PCB Via Drilling Systems	#1 UV Nanosecond Pulsed Lasers	#1 Laser Measurement Instruments	#1 High Performance Gratings	#1 Vibration Control	#1 Electronic Plating Chemistries	#1 Decorative Surface Finishing
#2 Control & Iso Valves	#1 Tool, Safety Chamber, Network	#1 Microwave Power	#3 RGA	#2 Component Test	#2 Opto-Mechanics	#2 IR Optics	#3 Integrated Optical Solutions	#3 Precision Motion	#3 UV Ultrafast Lasers	#1 Horizontal PCB Plating Equipment	#2 Functional Coatings for Corrosion & Wear Resistance
#3 Flow & Gas Delivery											

MKS CORE PRODUCT PORTFOLIO

1999 (IPO)

- **Market-Leading Technology**
- **Expansion into High Growth Markets**
- **Innovative Customer Solutions**
- **Shareholder Value Creation**

24 Acquisitions since IPO | **#1 or #2 Segment Share in Most Categories**

Sources: TechInsights, Internal Company estimate

Financial Discipline is Core to MKS' DNA

Experienced leadership with **proven execution track record**

Profitability Management

- Monthly profit and cash optimization program
- Centers of excellence
- Targeted R&D investment approach

Operating Flexibility

- Highly variable cost structure
- Asset-light capacity model
- Leverage multiple low-cost regions

M&A Execution

- Rapid achievement of cost synergies
- Comprehensive approach to technology and market synergies
- Expansion into 20 segment-leading categories

>1,000
continuous improvement projects (CIPs) in progress

>80%
of 2021 Pro Forma COGS was variable[1]

>2x
increase in Non-GAAP OM% of Newport business[2]

>1.5x
increase in Non-GAAP OM% of Photon Control business[3]

[1] See Slide 3 for additional information regarding the calculation of pro forma results of MKS and Atotech. [2] Compares Non-GAAP operating margin of the Newport business for the nine-months ended September 30, 2022 with the nine-months ended September 30, 2016. [3] Compares Non-GAAP operating margin of the Photon Control business for the nine-months ended September 30, 2022 with the nine-months ended September 30, 2021.

Continuous Improvement a Key Part of Our Business Process

MKS has adopted **lean across global operations and functions**

Central Lean Team

Team of lean specialists working with the organization across the globe

Lean Academy

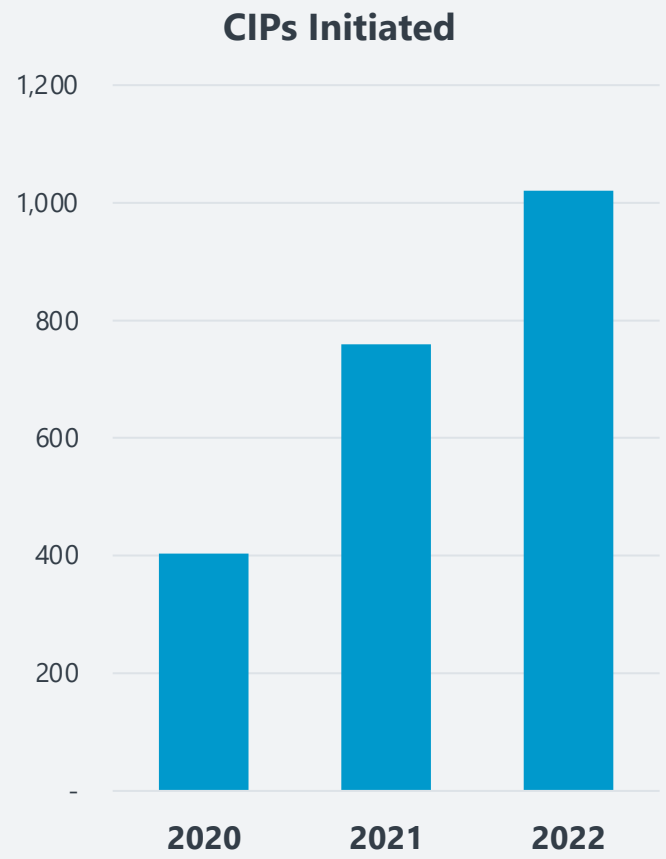
Standardizing templates, tools, training and methodology across MKS, targeted at every single employee

Kaizen

Extends beyond manufacturing, applies to entire business, including key functional areas

Continuous Improvement Program

Global portal for all employees to submit ideas for continuous improvement, directly tied to MKS Profit and Cash Program



Atotech Integration & Cost Synergy Update

STATUS

On track to achieve $55 million synergy target within 18-36 months of closing

REVENUE GROWTH

- Cross-selling and technology synergy opportunities—Optimize the Interconnect℠
- Positioning for future design cycles

DRIVING COGS & OPEX EFFICIENCIES

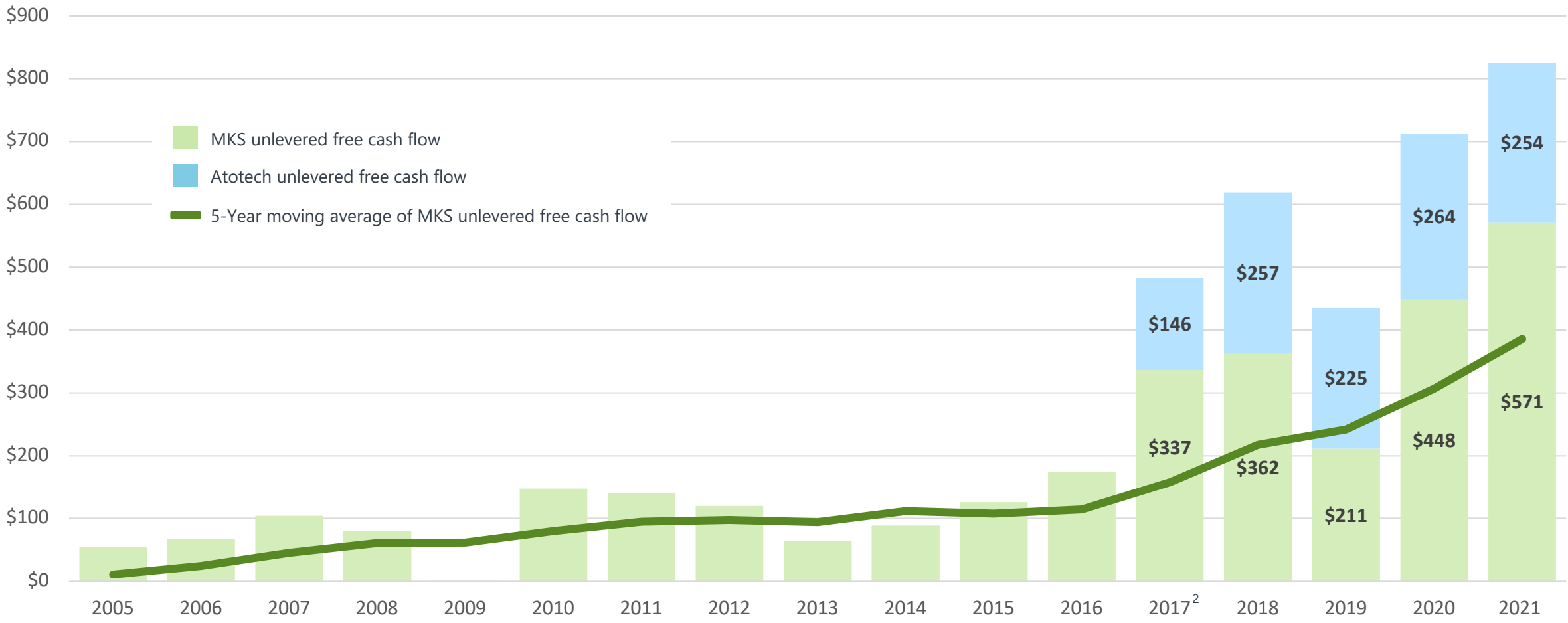
Procurement and Logistics

- Leverage lowest rates from the two companies for common products
- Leverage scale and renegotiate contracts from common suppliers

Scale Benefits

- Reduce 3rd party services by jointly building internal capabilities
- Eliminate redundant corporate-related Executive, BOD and public company costs

MKS' Strong Track Record of Unlevered Free Cash Flow Generation



MKS has delivered strong & growing unlevered cash flow through economic cycles[1]

[1] Unlevered free cash flow is net cash provided by operating activities less purchases of property, plant and equipment plus interest paid net of taxes. Net cash provided by operating activities of Atotech does not include adjustments from IFRS or adjustments to conform to the accounting policies of MKS. Amounts in millions. [2] Atotech became a standalone company in 2017 when it was spun off from TotalEnergies.

Capital Deployment Focused on Long-Term Value Creation

1

ORGANIC GROWTH & DIVIDENDS

- Strong organic investments
- Grow dividend over time
- Capex 3% - 5% of revenue

2

DEBT MANAGEMENT

- Accelerated debt paydown
- Opportunistic re-pricings
- Maintain strong liquidity

3

M&A / BUYBACK

- Disciplined M&A is a component of our growth strategy
- Opportunistic share buybacks
- Maximize long-term shareholder value

Proven Track Record of De-Levering

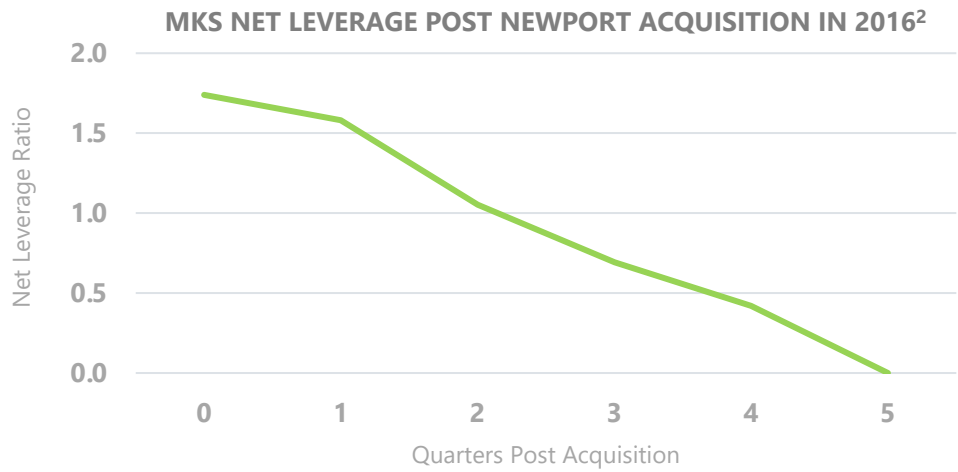
Healthy FCF through cycles + **more stable revenue mix** supports de-leveraging goals

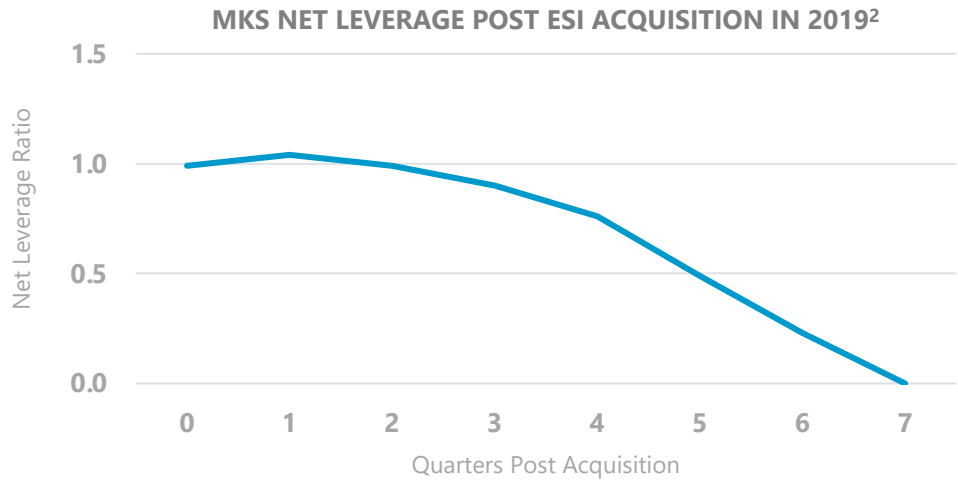
Disciplined Approach

- Long-term target gross leverage ratio of ~2.0x by 2027
- Strong history of aggressive de-levering
  - Made $100 million voluntary prepayment in Dec 2022
- Strong history of opportunistic re-pricings
  - 5 repricings between 2016 and 2019

Combined Company Net Leverage of 3.3x[1]

- Near-term FCF priority: debt paydown
- No material maturities until 2027; 50% of debt is hedged
- Favorable mix of resilient consumables & services revenue
- Capital structure allows for early prepayment and repricing flexibility



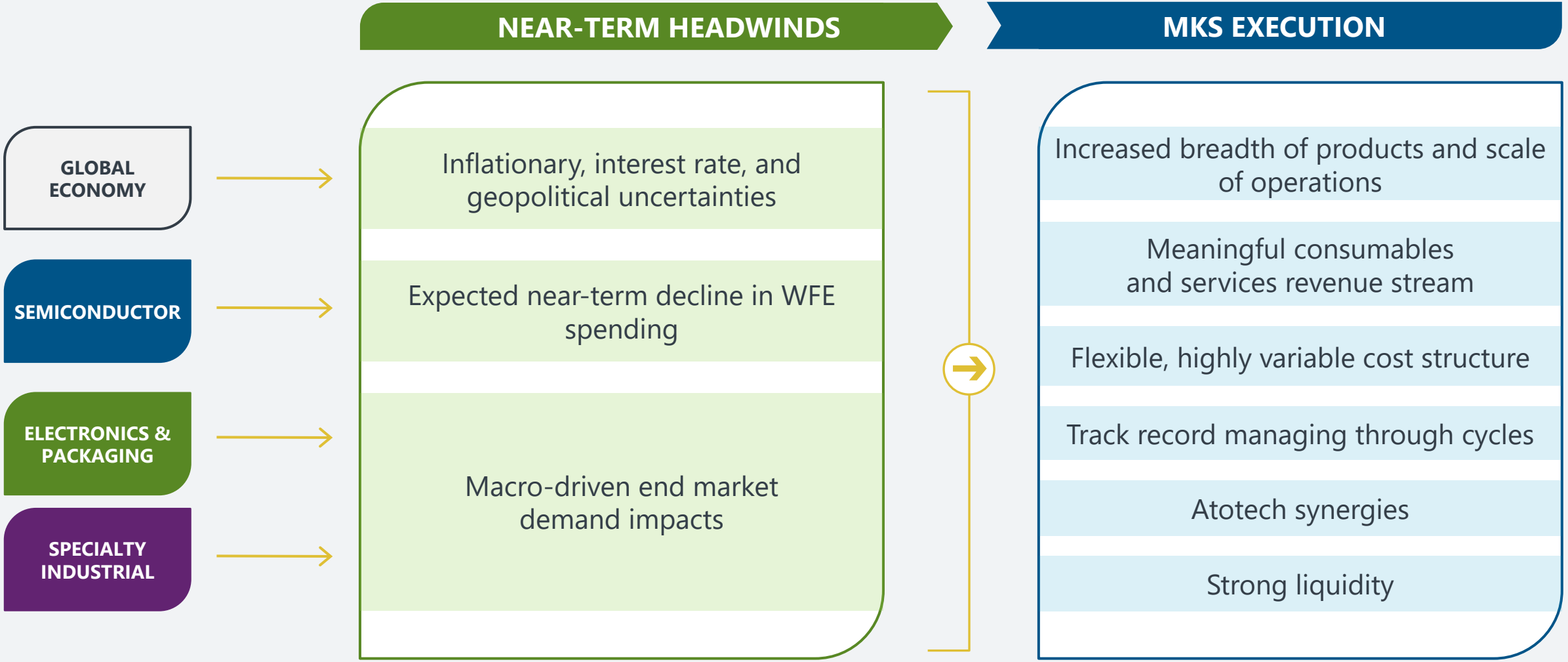


[1] Principal outstanding on MKS' credit agreement less cash and short-term investments at September 30, 2022, divided by combined company trailing 12-month Adjusted EBITDA at September 30, 2022. See Slide 3 for additional information regarding the calculation of combined company results of MKS and Atotech.

[2] Principal outstanding on MKS' prior credit agreement less cash and short-term investments, divided by trailing 12-month Adjusted EBITDA of MKS and Newport in the quarters post-acquisition of Newport, and of MKS and ESI in the quarters post-acquisition of ESI.

Near-Term Execution

MKS is well-positioned to manage through macro and cyclical changes



Long Term Revenue Model

End Market Revenue	Long-Term Model 2022-2027[1]	Market Growth Assumptions
Semiconductor	WFE + 200 bps	*WFE (4% - 7%)[2]*
Electronics & Packaging	GDP + 300 bps	*GDP (~3%)[3]*
Specialty Industrial	GDP+	*GDP (~3%)[3]*
2022-2027[1] Revenue CAGR	**>5%**	

[1] Long-term model for Revenue CAGR based on pro forma results of MKS and Atotech through September 30, 2022, plus the midpoint of the fourth quarter guidance provided on November 3, 2022, compared to 2027, and excludes the potential impact of changes in palladium prices, which are passed through to customers, and foreign exchange rates. See Slides 43, 66 and 83 for additional information regarding the calculation of the growth profile for Semiconductor, Electronics & Packaging, and Specialty Industrial, respectively. [2] TechInsights, Internal Company estimate. [3] Organization for Economic Co-operation and Development (OECD) report

Long Term Profitability Model

	2027 Target Profitability
Non-GAAP Gross Margin	>47%
Non-GAAP Operating Margin	>26%
Adjusted EBITDA Margin	>29%
Non-GAAP Tax Rate	25 - 27%

Translating Long-Term Model Through 2027

>$5.6B

2027 REVENUE

>$1.6B

2027 ADJUSTED EBITDA

>$13

2027 NON-GAAP EPS

Key Messages

Strategic evolution into broad-based foundational solutions provider

Strong profitability profile, with attractive earnings growth track record

Capital allocation strategy rooted in long-term value creation

Projected 2022 – 2027 Non-GAAP EPS CAGR of >10%[1]

[1] *Long-term model based on pro forma results of MKS and Atotech through September 30, 2022, plus the midpoint of the fourth quarter guidance provided on November 3, 2022, compared to 2027*

Q&A

Thank you

Analyst Day | December 2022

Appendix

Reconciliations

2015 Revenue by End Market and Market Stream

	MKS
Semiconductor	$ 562
Non-Semiconductor	252
	$ 814
Semiconductor	69%
Non-Semiconductor	31%
Equipment	$ 697
Services	116
	$ 814
Equipment	86%
Services	14%

2021 Revenue by End Market and Market Stream

	MKS	ATOTECH	PRO FORMA
Semiconductor	$ 1,826	$ -	$ 1,823
Electronics & Packaging	344	982	1,331
Specialty Industrial	780	518	1,296
	$ 2,950	**$ 1,499**	**$ 4,449**
Semiconductor	62%	0%	41%
Electronics & Packaging	12%	65%	30%
Specialty Industrial	26%	35%	29%
Equipment	$ 2,579	$ 137	$ 2,716
Services	371	58	429
Consumables	-	1,304	1,304
	$ 2,950	**$ 1,499**	**$ 4,449**
Equipment	87%	9%	61%
Services	13%	4%	10%
Consumables	0%	87%	29%

***MKS**: Reported total revenue by MKS in its Annual Report on Form 10-K for the fiscal year ended December 31, 2021.*

***Atotech**: Reported total revenue by Atotech in its Annual Report on Form 20-F for the fiscal ear ended December 31, 2021. End market allocation is based on MKS' understanding of uses of Atotech products and services. Revenue consists of chemistry revenue allocated to consumables, equipment allocated to equipment and services allocated to services.*

In millions

Reconciliations

2015 Non-GAAP Gross Margin, Adjusted EBITDA and Adjusted EBITDA Margin

Revenue	$ 814
Gross profit	363
Sale of previously written down inventory	(2)
Non-GAAP gross profit	$ 361
Non-GAAP gross margin	44%
Net income	$ 122
Interest expense, net	(3)
Provision for income taxes	37
Depreciation	15
Amortization of intangible assets	7
Stock-based compensation	13
Sale of previously written down inventory	(2)
Restructuring and other	2
Adjusted EBITDA	$ 192
Adjusted EBITDA margin	24%

2021 Pro Forma Non-GAAP Gross Margin, Adjusted EBITDA and Adjusted EBITDA Margin[1]

Revenue	$4,449
Gross profit	2,121
GAAP and Non-GAAP gross margin	48%
Net income	$ 319
Interest expense, net	263
Loss on extinguishment of debt	7
Provision for income taxes	94
Depreciation	94
Amortization of intangible assets	328
Stock-based compensation	46
Restructuring and other	10
Acquisition and integration costs	115
Management fee	3
COVID-19 adjustment	1
Adjusted EBITDA	$1,280
Adjusted EBITDA margin	29%

[1] *Amounts from unaudited pro forma condensed combined financial information, as filed by MKS in exhibit 99.3 to its Current Report on Form 8-K on August 24, 2022. Management fee and COVID-19 adjustment from Atotech's Annual Report on Form 20-F for the fiscal year ended December 31, 2021.*

In millions

Reconciliations

Non-GAAP Operating Margin Newport Business[1]

	YTD Q3'16	YTD Q3'22
Revenue	$448	$636
Income (loss) from operations	(13)	142
Acquisition and integration costs	27	0
Restructuring and other	0	1
Acquisition inventory step-up	15	0
Amortization of intangible assets	21	11
Non-GAAP income from operations	$50	$154
Non-GAAP operating margin	11.2%	24.2%

Non-GAAP Operating Margin Photon Control Business[2]

	YTD Q3'21	YTD Q3'22
Revenue	$47	$58
Income from operations	4	15
Acquisition and integration costs	6	0
Restructuring and other	0	0
Amortization of intangible assets	4	11
Non-GAAP income from operations	$14	$26
Non-GAAP operating margin	29.8%	45.6%

[1] Reconciliation of Non-GAAP operating margin of the Newport business for the nine months ended September 30, 2022 and the nine months ended September 30, 2016

[2] Reconciliation of Non-GAAP operating margin of the Photon Control business for the nine months ended September 30, 2022 and the nine months ended September 30, 2021

In millions

Reconciliations

Unlevered Free Cash Flow

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
MKS																					
Net cash provided by operating activities	$ 20	$ 14	$ (0)	$ 66	$ 64	$ 78	$ 119	$ 93	$ 5	$ 164	$ 156	$ 137	$ 76	$ 102	$ 138	$ 180	$ 355	$ 414	$ 245	$ 513	$ 640
Purchases of property, plant and equipment	(15)	(8)	(6)	(18)	(10)	(11)	(15)	(13)	(4)	(16)	(16)	(18)	(12)	(13)	(12)	(19)	(31)	(63)	(64)	(85)	(87)
Cash paid for interest	1	1	1	-	1	1	1	1	-	-	-	-	-	-	-	21	21	15	40	26	23
Tax effect on cash paid for interest[2]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(8)	(8)	(3)	(9)	(6)	(5)
Unlevered free cash flow	$ 6	$ 7	$ (6)	$ 48	$ 54	$ 68	$ 105	$ 80	$ 1	$ 148	$ 141	$ 120	$ 64	$ 89	$ 126	$ 174	$ 337	$ 362	$ 211	$ 448	$ 571
Atotech[1]																					
Net cash provided by operating activities																	$ 107	$ 167	$ 135	$ 161	$ 214
Purchases of property, plant and equipment																	(33)	(29)	(43)	(24)	(28)
Cash paid for interest																	71	119	133	127	68
Tax effect on cash paid for interest[2]																	-	-	-	-	-
Unlevered free cash flow																	$ 146	$ 257	$ 225	$ 264	$ 254

[1] Financial information of Atotech has been reported in accordance with IFRS.

[2] MKS tax effect of cash paid for interest was calculated at an estimated US blended tax rate of 37.5% from 2001 to 2017 and 23.5% from 2018 to 2021. Atotech interest was generally non-tax deductible so no income tax rate was applied to Atotech cash paid for interest.

In millions