



»» LPKF CAPITAL MARKETS DAY

LPKF LASER & ELECTRONICS AG | SEPTEMBER 2022

LPKF
Laser & Electronics
Vitron 5000

AGENDA

LPKF'S CAPITAL MARKETS DAY 2022



9:30 – 10:00 CET

Registration

10:00 - 10:15 CET

Welcome

10:15 – 11:15 CET

Keynote & Company Strategy

Presentation and Q&A

11:15 – 11:45 CET

Welding

Presentation and Q&A

11:45 – 12:30 CET

Electronics & LIDE

Presentation and Q&A

12:30 – 13:15 CET

Lunch Break

13:15 – 14:45 CET

Demonstrations & Tour:

LIDE Foundry, ARRALYZE Bio-Lab & Electronics

14:45 – 15:00 CET

Coffee Break

15:00 - 15:45 CET

Development & Arraylize

Presentation and Q&A

15:45 – 16:15 CET

Solar & LTP

Presentation and Q&A

16:15 – 16:30 CET

Current Trading, Financials and Aspiration

16:30 – 17:00 CET

Wrap-up and final Q&A Panel

Afterwards Get Together

Dr. Klaus Fiedler, CEO - Christian Witt, CFO

Dr. Klaus Fiedler, CEO - Christian Witt, CFO

Simon Reiser

Managing Director Welding

Dr. Roman Ostholt

Managing Director Electronics & LIDE

Business Experts

Britta Schulz & Dr. Robin Krüger

Managing Director Development, Vice President Arraylize

Jürgen Bergedieck

Managing Director Solar

Dr. Klaus Fiedler, CEO - Christian Witt, CFO

Dr. Klaus Fiedler, CEO - Christian Witt, CFO

A man with short brown hair, wearing a white lab coat and blue nitrile gloves, is holding a whiteboard. He is looking to the right of the frame. The background is a dark grey wall with a perforated metal panel. A semi-transparent white horizontal band is overlaid across the middle of the image, containing the text.

KEYNOTE AND COMPANY STRATEGY

PRESENTED BY DR. KLAUS FIEDLER AND CHRISTIAN WITT



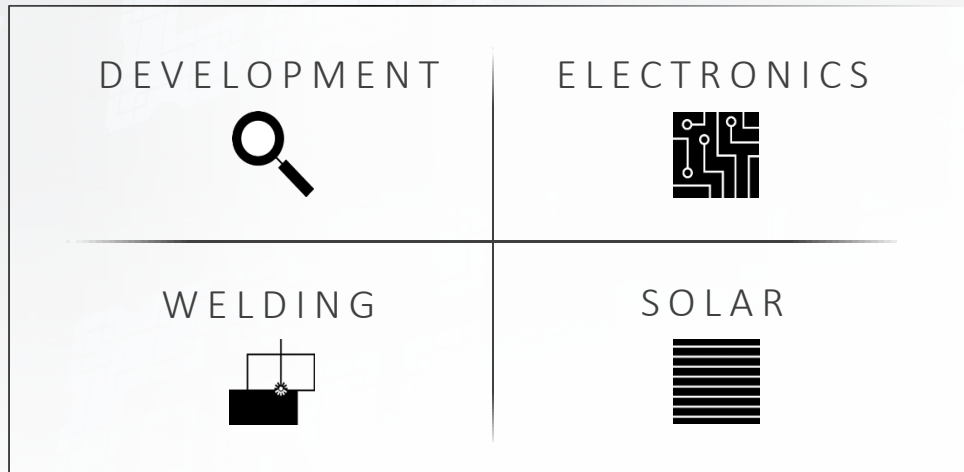
» LASER APPLICATION SPECIALIST

Leading supplier of laser-based precision manufacturing solutions

45 years of experience plus **strong innovation pipeline** (>200 patents)

Enabler of new applications in growth markets

Investing around 10% of revenue in R&D and **New Business Initiatives**



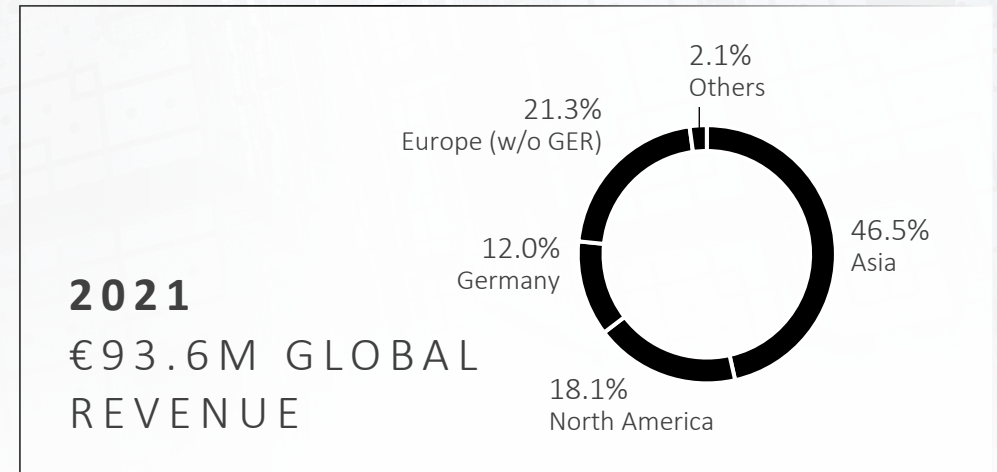
» GLOBAL PLAYER

Selling in more than 60 countries and Export share of $\approx 90\%$

Global Footprint: Four Sales Companies in US and Asia

≈ 750 employees world-wide

Engineering and technology know-how based in Europe



BUSINESS STRUCTURE

FOUR BUSINESS UNITS, TWO NEW BUSINESS INITIATIVES



BU Development



Equipment and Consumables for PCB Prototyping

BU Electronics



Processing Equipment for Electronics Manufacturing

BU Solar



Processing Equipment for Glass Surface Structuring

BU Welding

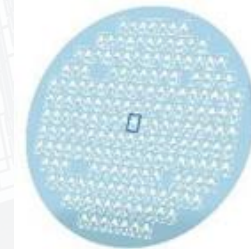


Processing Equipment for Plastic Welding

End-Customer Markets

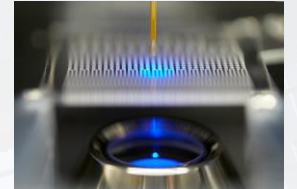
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|--|--|---|--|
| <ul style="list-style-type: none"> ▪ Consumer Electronics ▪ Medical ▪ Defense | <ul style="list-style-type: none"> ▪ Consumer Electronics ▪ Medical ▪ SMT | <ul style="list-style-type: none"> ▪ Solar Modules ▪ Architecture Glass | <ul style="list-style-type: none"> ▪ Automotive/E-Mobility ▪ Medical ▪ Consumer Electronics |
|--|--|---|--|

NBI LIDE



Processing Equipment and Foundry for 3D Glass Structuring

NBI ARRALYZE



Equipment and Consumables for Bio Tech Analysis

End-Customer Markets

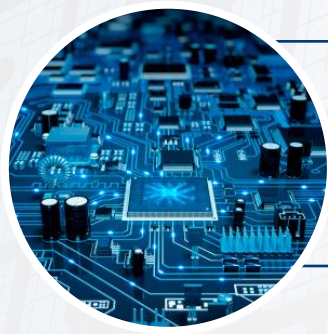
- | | |
|---|--|
| <ul style="list-style-type: none"> ▪ Semiconductor Packaging ▪ Displays ▪ MEMS | <ul style="list-style-type: none"> ▪ Drug Development ▪ Cell Therapy |
|---|--|

MARKETS AND MEGATRENDS

MARKET GROWTH IS DRIVEN BY GLOBAL MEGATRENDS



MINIATURIZATION



Increasing density in electronics packaging drives need for precision manufacturing tools



End of Moore's law drives need for novel semiconductor packaging solutions



High density design of electronic devices drives need for precision plastic welding

CARBON NEUTRALITY



Increasing share of solar power in energy production drives need for high volume, high precision manufacturing tools



E-mobility drives demand for battery pack manufacturing tools



Energy consumption of manufacturing processes and end products of increasing importance

CONNECTIVITY



Continuous innovation in mobile devices drives need for novel display design and manufacturing solutions



Growth and increasing complexity in RF solutions drives need for rapid prototyping

AGING POPULATION



Increasing demand for medical devices and consumables drives need for efficient manufacturing solutions



Drug development and personalized medicine drives need for efficient single cell analysis

» GROWTH STRATEGY

CONSISTENT APPROACH ACROSS BUSINESS UNITS



» GROW THE CORE



Superior customer benefit through sustained technology advantage
⇒ *gain share*



Focus on growing application fields
⇒ *increase addressable market*



Active product portfolio management to avoid commoditization
⇒ *sustain margins*



Serviceable Addr. Market
EUR 350 million



Ø Annual Growth Rate
8%

» EXPAND INTO NEW MARKETS



Leverage core competencies to enter new markets with disruptive solutions



Focus on scalable business opportunities



Proactive approach to secure core IP and first mover advantage



Serviceable Addr. Market
EUR 1.4 billion



Ø Annual Growth Rate
17%



INNOVATION

We are innovation leaders and always ahead of the curve



MARKET AND TRENDS

We know the needs of our markets and pick up on new trends at an early stage



ENTREPRENEURIAL BOLDNESS

Our actions are characterized by entrepreneurial action and courage



SIMPLIFICATION

Increasing digitization helps us to improve efficiency



SMART PEOPLE

Our success is shaped by our employees and their knowledge



RESPONSIBLE ACTING

We act in partnership and responsibly



KEY SUCCESS FACTORS

We identify new markets and trends at an early stage. We want to develop and invest courageously into disruptive new technologies to provide a superior customer benefit. Our actions are targeted at long term sustainable growth. To achieve this, we drive the following initiatives:

- Increased market focus through a business-driven organization structure, a new marketing setup and an aligned IP management
- Implementation of modern IT systems to support market forecasting and operations
- Set up of a process improvement program called “Simplify” to strengthen scalability and agility
- Establishment of long-term talent management

OPERATING MODEL LEADS TO ATTRACTIVE EBIT

STABLE GROSS MARGIN AND FIXED COST DEGRESSION IN CORE & NEW BUSINESS



Core Business

New Business Initiatives

Gross Margin



Historically stable or improving gross margins



Permanent innovation in technology, application & product

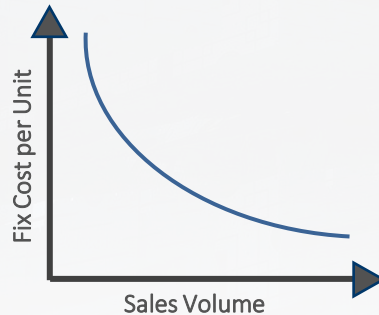


Price increases compensating inflation



Attractive Gross Margins above Core Business

Fixed Cost



fixed cost depression by scaling



Lower additional fixed costs ratio

Profit Margin

Operating leverage and growth leads to attractive EBIT Margin

ATTRACTION CASH CONVERSION CYCLE

SCALING AND OPERATIONAL MEASURES IN CORE AND GROWTH AREAS



Core Business



Equipment

- + Inventory: Supply situation
- DIO improvement when Scaling
- + Inventory is currently consciously increased to assure deliveries
- + DWC not foreseen to go back to 2019 levels due to generally changed environment

New Business Initiatives



Equipment LIDE

- + lower inventory (variants)
- + more down payments
- requirements semi customers



Equipment ARRALYZE

- + lower inventory (standard)



LIDE Foundry & Service

DSO/DWC
≈ 30 – 60 Days

Target: Ø 15% - 20% of annual sales

Target: Ø 10% - 15% of annual sales

ASSET-LIGHT BUSINESS MODEL

SUFFICIENT PRODUCTION CAPACITIES WITH ASSET LIGHT ASSEMBLY



DEVELOPMENT

- Production Capacity 2 x 2022



ELECTRONICS

- Production Capacity 3 x 2022
+ LIDE equipment production



WELDING

- Production Capacity 4 x 2022



SOLAR

- Production Capacity 2 x 2022

Core Business, LIDE Equipment, ARRALYZE: Assembly, no Machining, low value add in Production

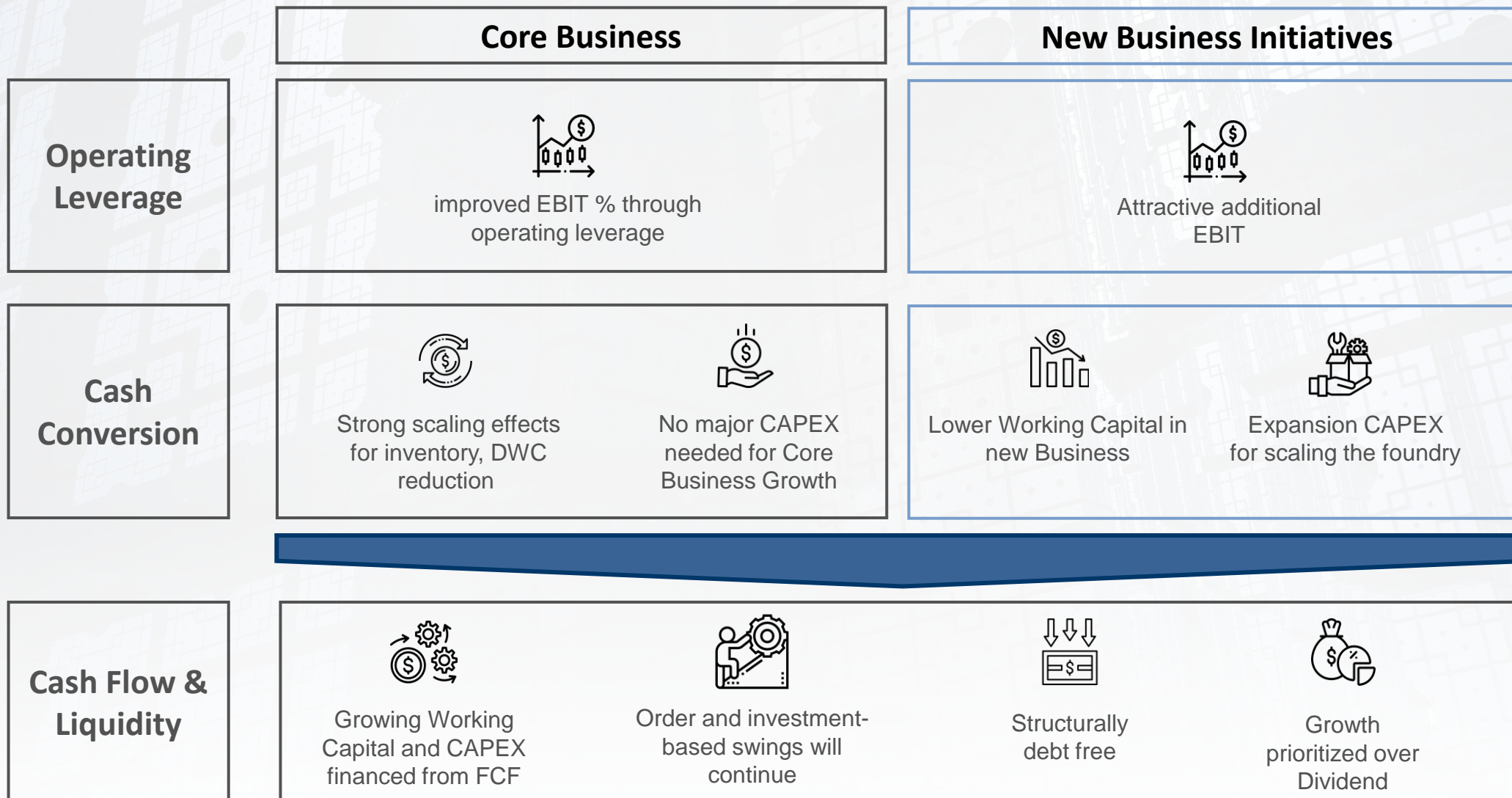


LIDE FOUNDRY

- Foundry up and running, expansion investment of EUR 10+ million in 2023 – 2026

SCALING BUSINESS OPERATIONS AND FINANCIALS

GROWTH IN CORE AND NEW BUSINESS FINANCED OUT OF CASH FLOW



LPKF'S ESG SCOPE

BEAMING SUSTAINABILITY – OUR HOLISTIC SUSTAINABILITY APPROACH



Affordable and Clean Energie



Sustainable consumption and production



Innovation and economic growth



Fair and responsible supply chains



Good Corporate Citizenship



Reduction of CO₂ emissions

We enable Smart Sustainable Solutions

How we enable sustainability for our customers

Sustainability is part of our roots

How we contribute to sustainability ourselves

Products and Life Cycle

We develop efficient and sustainable products & applications to enable smart sustainable solutions for our customers

Resources

We strive for continuous optimization of energy and resource consumption for ourself and our customers

Innovation & Economic Growth

Strategic goal of R&D activities is to achieve or expand innovation leadership and enable customer for a more sustainable economy

Supply Chain

Reduction of environmental impact within our supply chain and fostering of human rights and standards

Employees & Society

We take responsibility for our employees and the people around us. We value diversity and equal opportunities.

Communication & Governance

We communicate transparently with our stakeholders in all respects and demonstrate responsible corporate governance.

LPKF's long-term Sustainability Strategy enables the company to Stakeholder Value Creation

SUSTAINABILITY RATINGS

CONTINUOUS INCREASE IN RATINGS



Rating Agencies	Metrics	Rating History	Peer Group	Awards
		<p>AAA – CCC</p>	<p>TOP 33 % in Peer Group</p>	<p>January 2022 Place 38 of German climate conscious businesses 2022 at <u>Capital Magazin</u>¹</p> <p>By Alpora AG</p>
		<p>A+ - D-</p>	<p>Decile Rank</p> <p>Low relative performance High relative performance</p> <p>Top 30% in Industry</p>	
		<p>0 – 100 0 Best, 100 Worst</p>	<p>TOP 30 out of 583 in our Industry Group</p>	
		<p>100 – 0 100 Best, 0 Worst</p>	<p>N/A</p>	
				<h3>Memberships & Certifications</h3>

1) Source: <https://www.capital.de/wirtschaft-politik/deutschlands-klimabewusste-unternehmen-2022>

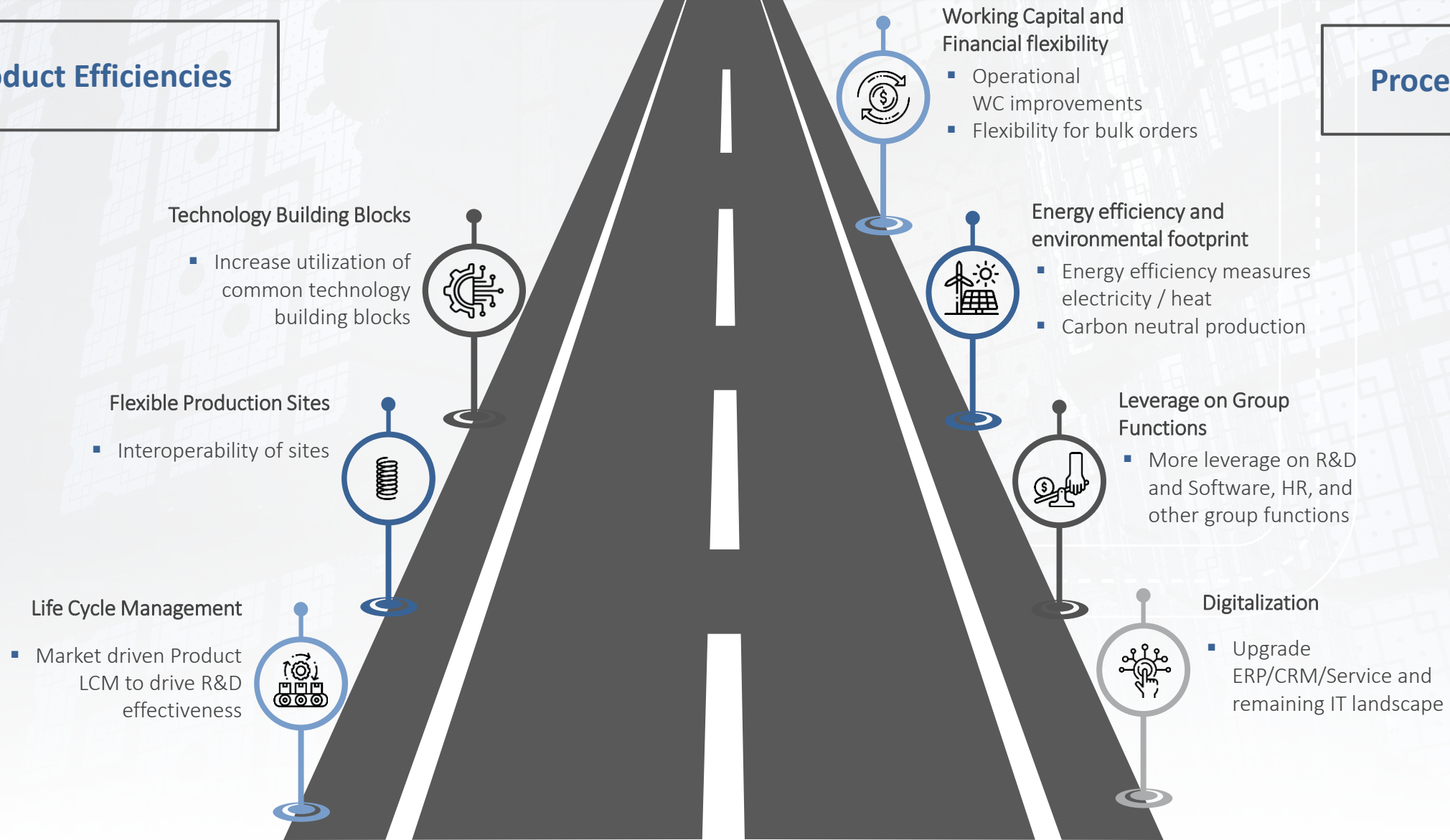
ROADMAP FOR SCALING LPKF BUSINESS

KEY INITIATIVES TO LEVERAGE THE OPERATING MODEL



Product Efficiencies

Process Efficiencies





»» THANK YOU AND Q&A SESSION

A welder wearing a green t-shirt and a protective mesh sleeve on his right arm is working on a complex stainless steel machine. He is holding a welding torch and appears to be in the process of welding a component. The background shows a clean industrial environment with various pipes and machinery.

BUSINESS UNIT
WELDING

PRESENTED BY MR. SIMON REISER



» SIMON REISER

BUSINESS UNIT MANAGEMENT WELDING

- Dipl. Industrial Engineer (FH) (MBA)
- Frankfurt School of Finance & Management
Mergers and Acquisitions Professional
- Worked as Vice President Business Unit Chassis Systems and followed by various leadership roles in the automotive industry in Germany and Asia
- Vast experience in Key Account Management, Sales Strategy and Business Development
- Managing Director of the Business Unit Welding starting October 2019



» The heart and soul of LPKF is creativity and innovation to meeting the challenges of a changing world.

BUSINESS UNIT WELDING

KEY FACTS



Location





 **FÜRTH,**
Germany



Employees

 **147**
world wide

Main Markets

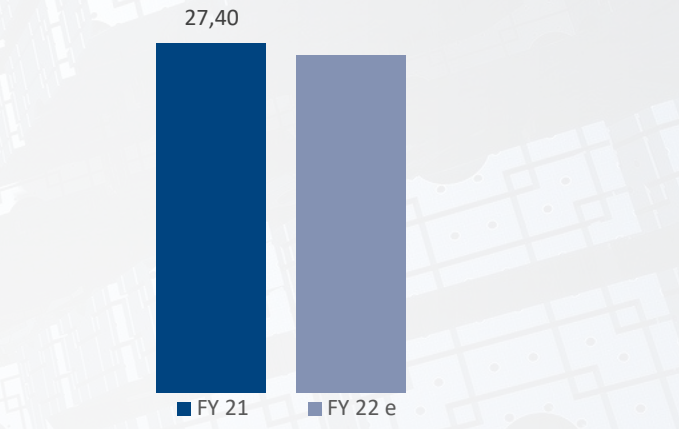
Automotive	Medical	Consumer	Others
			

Market Offering

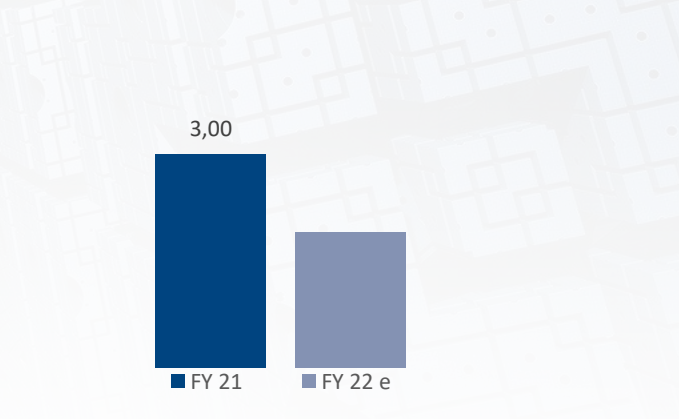
Full Equipment and Services provider for laser plastic welding

Application Center & Consulting	Machines & Tools	Service & Contract Manufacturing
		 L7 LaserMicronics MICROMACHINING SERVICES

Revenue 2021 – 2022e in mn €



EBIT 2021 – 2022e in mn €



BUSINESS UNIT WELDING

MARKETS AND VALUE PROPOSITION



Markets and Megatrends

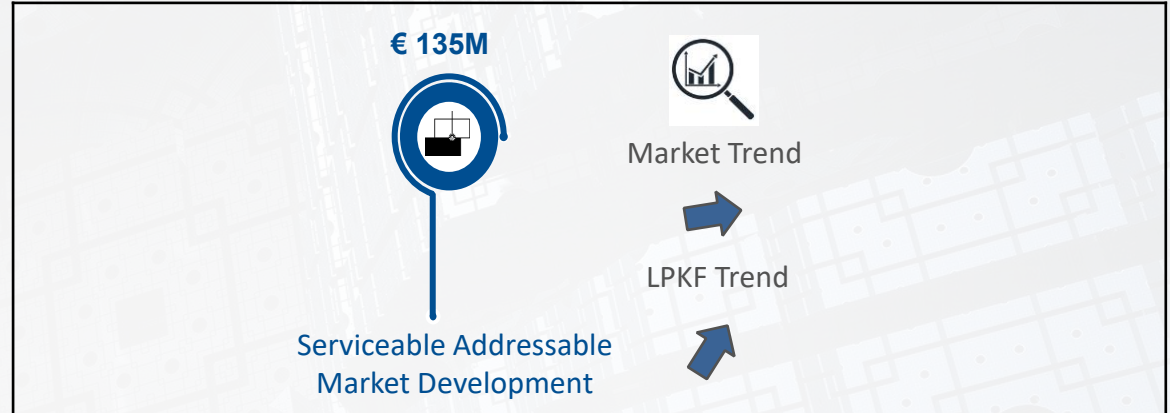
Electrification (AUTOMOTIVE)

- E-Mobility & Autonomous driving is increasing the number of control units and sensor equipment per vehicle

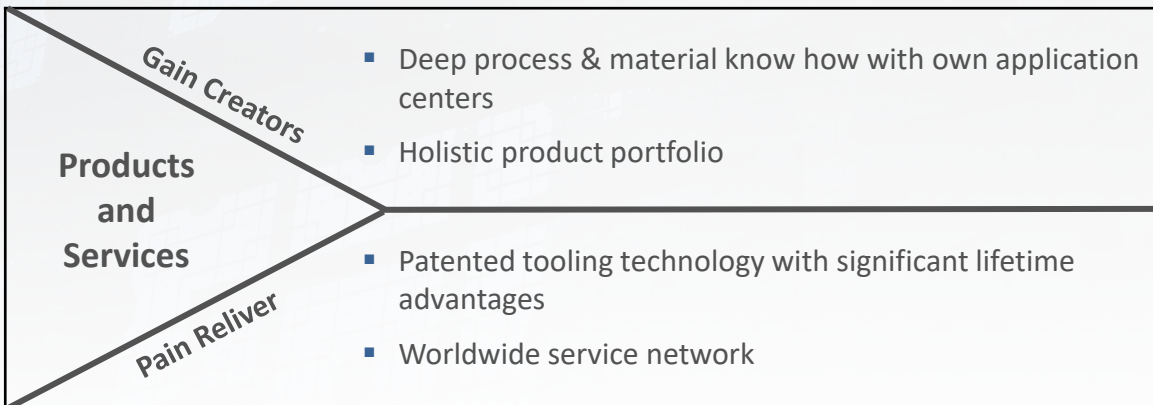
AGING POPULATION (MEDICAL)

- Demographic development & regular access to health care is increasing demand for electrical and disposable products

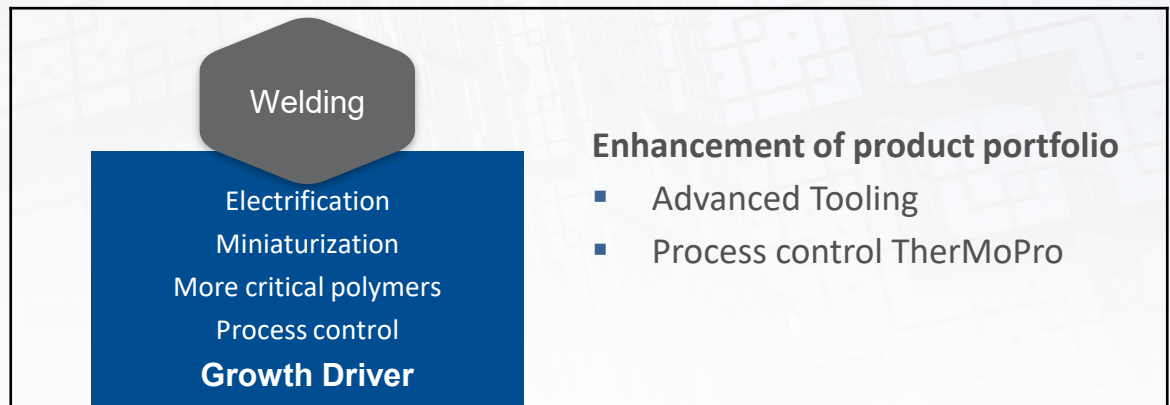
Market Size



Value Proposition

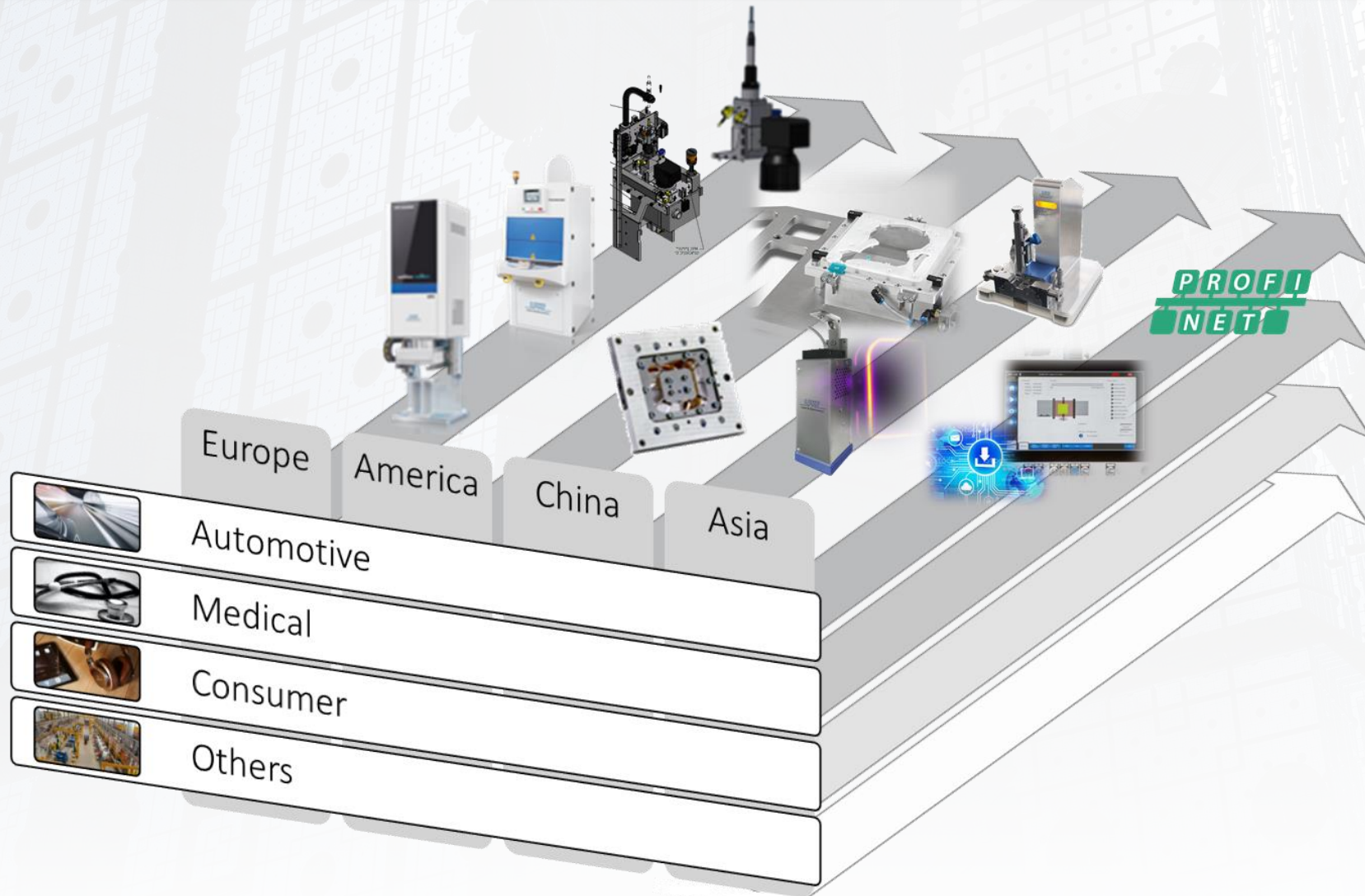


Products and Growth Drivers



TARGET MARKETS AND INDUSTRIES

4 + 4 + TECHNOLOGY FOCUS // PILLAR GROWTH STRATEGY



TECHNOLOGY ROADMAP

- Maintain best in class machine & tooling portfolio
- Patent protected technologies
- Complementary technologies, e.g., process monitoring
- Advanced and sustainable software architecture

4 REGIONS

- Strengthen local presence & capabilities
- Comply with market-specific requirements
- Leverage strength in global customers

4 INDUSTRIES

- Comply with industry-specific requirements
- Develop Application & Customer groups globally

LASER PLASTIC WELDING FOR E-MOBILITY

- Full electric powertrain
- Fuel cell components



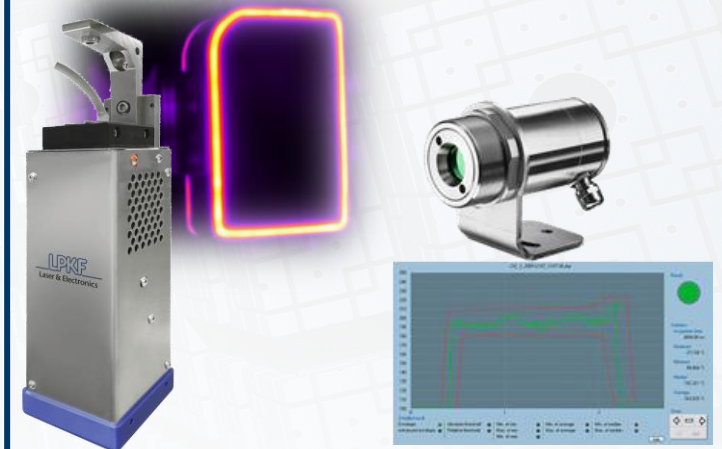
UNIQUE WELDING SYSTEMS FOR MASS- AND PROTOTYPE PRODUCTIONS

- LPKF patented wobble weld function
- Stand alone system PowerWeld 3D8000
- LPKF patented servo clamping modules



LPKF PROCESS CONTROL FOR 100% QUALITY CONTROL

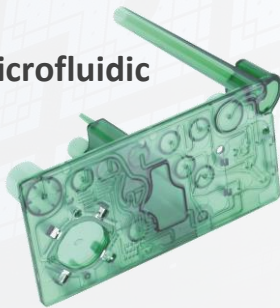
- Using thermocam. / pyrometer and software algorithm – developed by LPKF
- Detailed inspection of welding quality



LASER PLASTIC WELDING FOR MEDICAL

- Strong growth in medical business
- Welding the whole spectrum of medical applications

Microfluidic



Pumps



Insulin pump

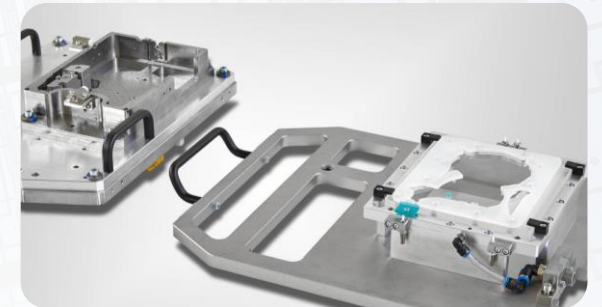
SPECIAL WELDING SYSTEMS FOR MEDICAL AND CLEAN ROOM

- Special machine systems for medical production environment



FOCUS ON TOOLING AND CLAMPING TECHNOLOGY

- Hybrid toolings with composites of material
- Vacuum and overpressure concepts



DIGITALIZATION // INDUSTRY 4.0 // INTERNET OF THINGS // BIG DATA

- Data management / storage / traceability of laser welding machines
- Efficient process set up and management



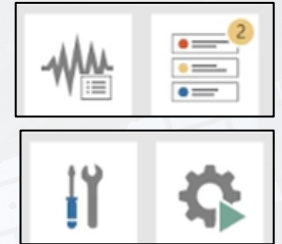
LPKF OPERATING SYSTEM AND SOFTWARE PORTFOLIO

- LPKF "WeldOS" Operating system
- LPKF "WeldApp" Applications



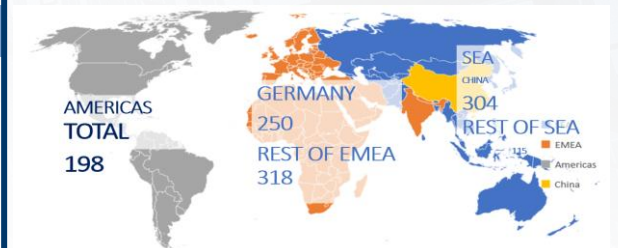
OEM LPKF WELDAPP'S

- Process set up
- Traceability
- Monitoring
- Analytics
- ...



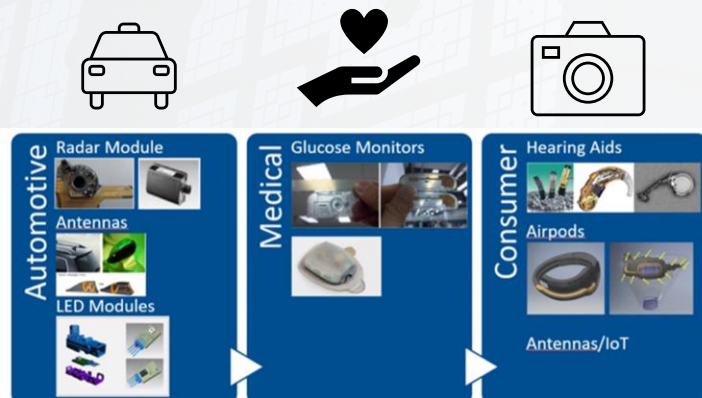
AFTERMARKET

- Upgrading of installed base
- 1200 systems installed



LASER PLASTIC WELDING FOR LDS APPLICATIONS

- Further development of application concepts for electrification & miniaturization



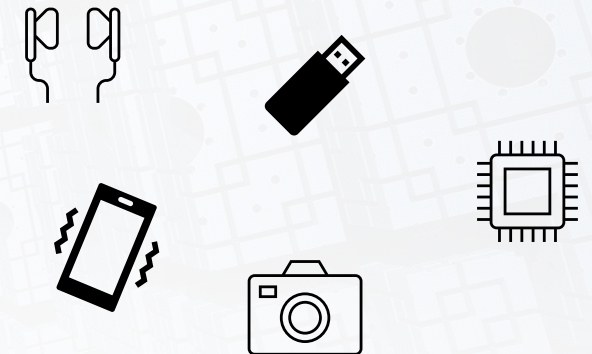
LPKF WELDS TECHNOLOGY

- Developed in 2020
- Synergies of LPKF business units WELDING + ELECTRONICS



FIRST APPLICATION IN SERIAL PRODUCTION

- First successful customer project from consumer electronics industries
- Established in 2021
- Further projects in the pipeline





»» THANK YOU AND Q&A SESSION



BUSINESS UNIT

ELECTRONICS

PRESENTED BY DR. ROMAN OSTHOLT

» DR. ROMAN OSTHOLT

BUSINESS UNIT MANAGEMENT ELECTRONICS

- RWTH Aachen University 2002-2007
Dipl.-Ing. Mechanical Engineering
- RWTH Aachen University 2007-2011
- Dr.-Ing. Mechanical Engineering
- Fraunhofer Institute for Laser Technology 2007-2011
- Joined LPKF as Innovation Manager in 2011
- Group Technology Manager 2014-2018
- Vice President LIDE since 2018
- Managing Director of the Business Unit Electronics starting 09/2019




» We find solutions for future challenges in the electronics industry.

ELECTRONICS AT A GLANCE

KEY FACTS



Location



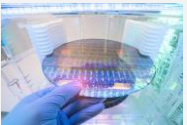

 **Garbsen, Germany**



Employees

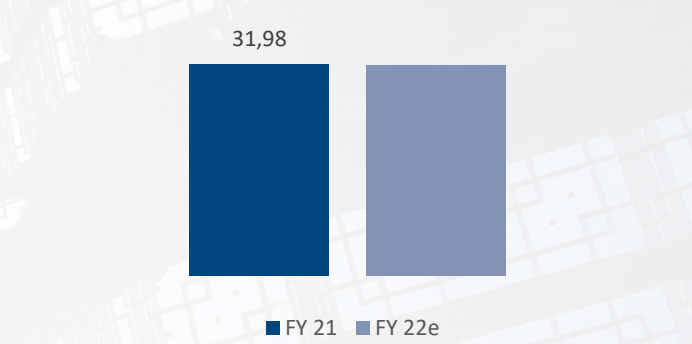
 **153**
world wide

Main Markets

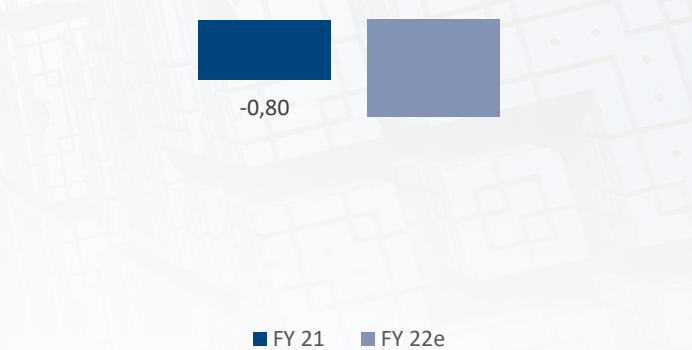
SMT  **Advanced Packaging**  **Semiconductor**  **Display** 

Market Offering

Revenue 2021 – 2022e in mn €



EBIT 2021 – 2022e in mn €



BUSINESS UNIT ELECTRONICS

MARKETS AND VALUE PROPOSITION



Markets and Megatrends

Markets

- Reluctance to increase capacity for consumer electronics in China
- After slow start of 2022, increasing activity in US and Europe
- Continued high interest in LIDE technology, but reluctance to change supply chains



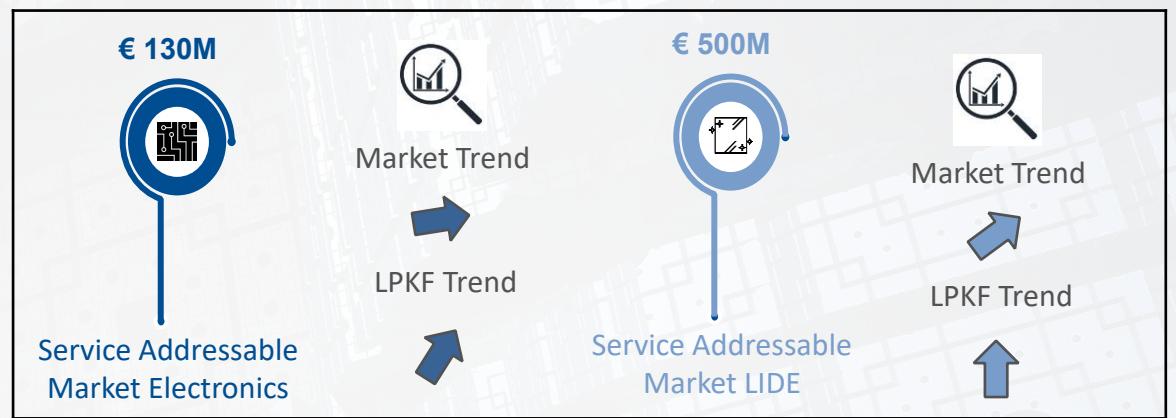
Re/Nearshoring due to diversification of supply chains



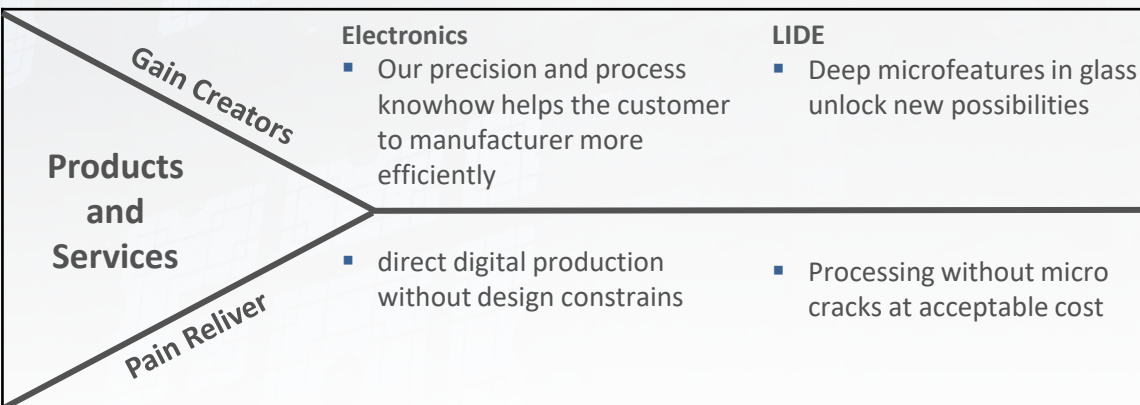
End of Moore's law shifts the focus of miniaturization to packaging

Resource efficient production

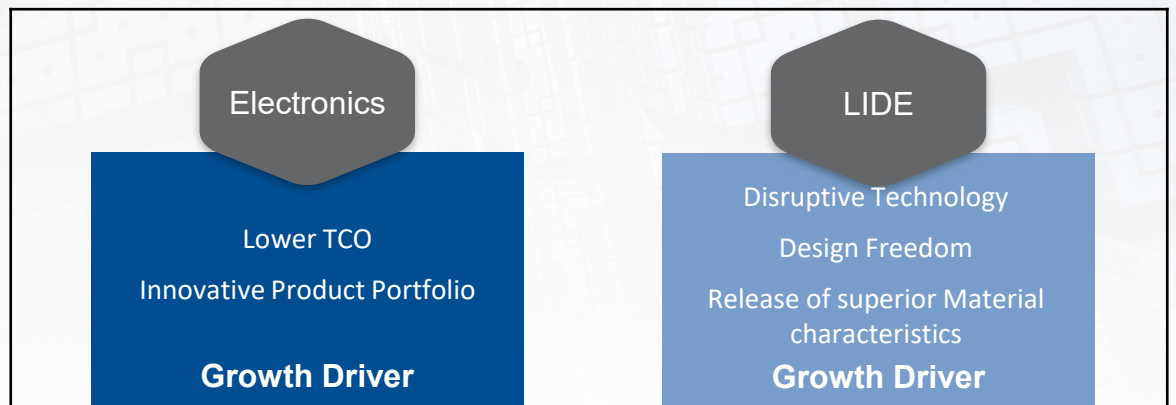
Market Size



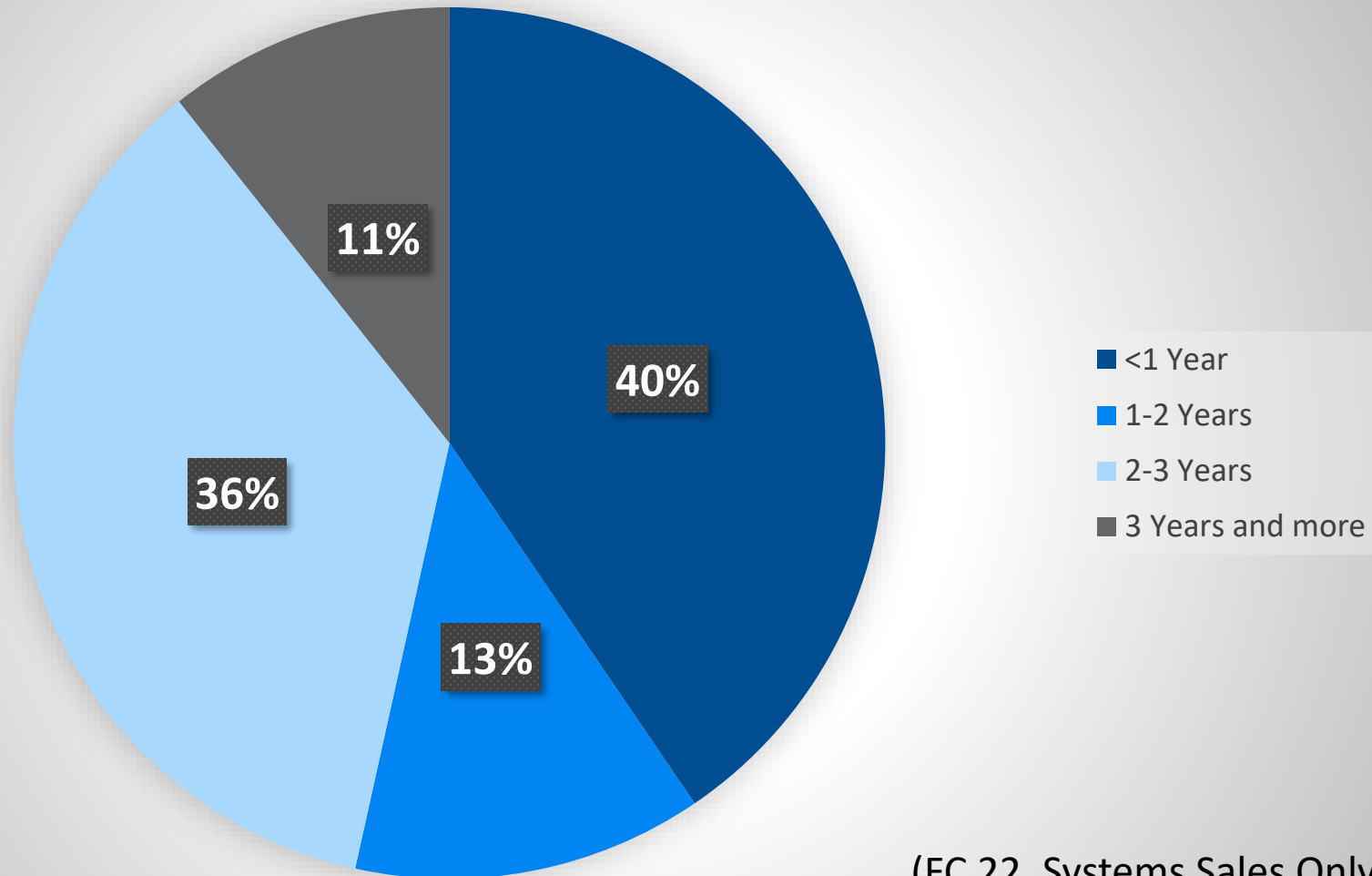
Value Proposition



Products and Growth Drivers

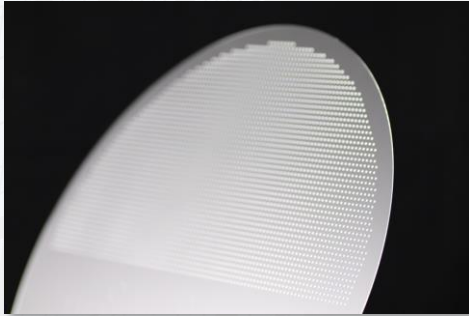


TURNOVER SHARE BY AGE OF PRODUCT

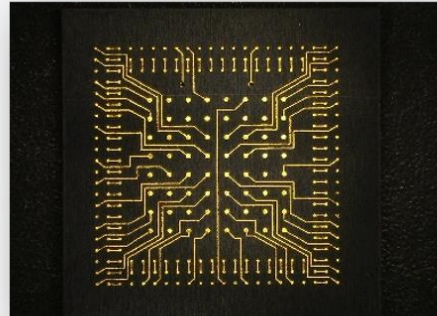


(FC 22, Systems Sales Only)

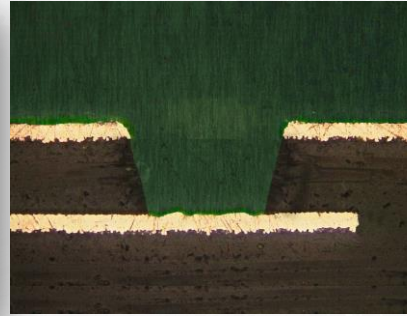
Laser solutions



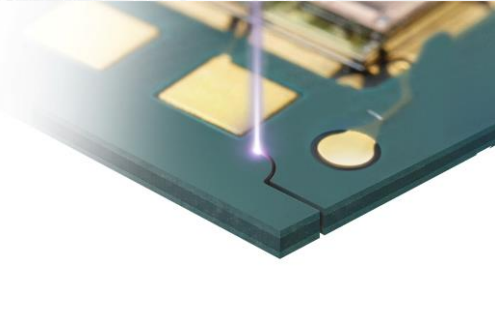
Glass Micro Processing



Additive Metallization



Drilling



Cutting

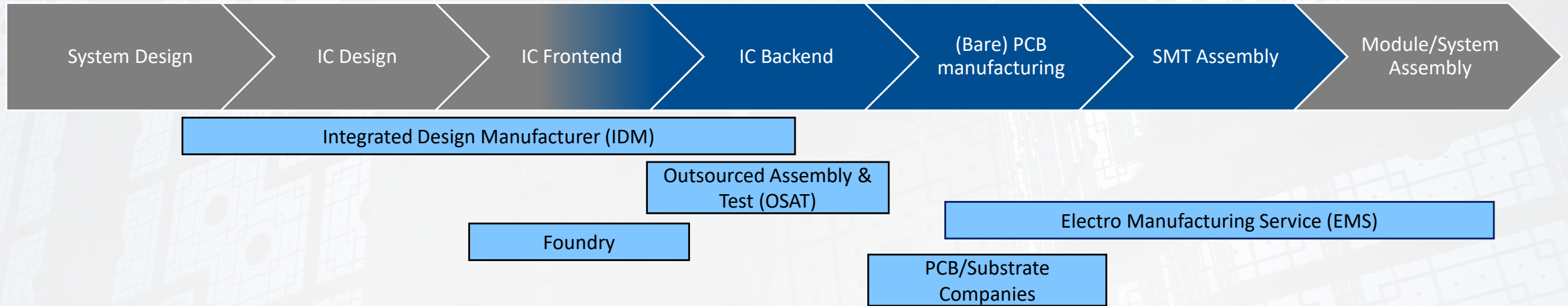
Market segments



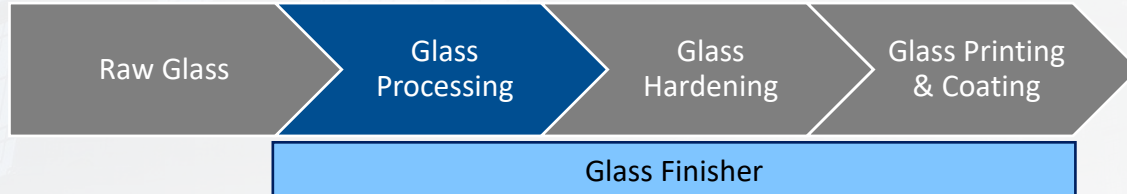
OUR CUSTOMER GROUPS



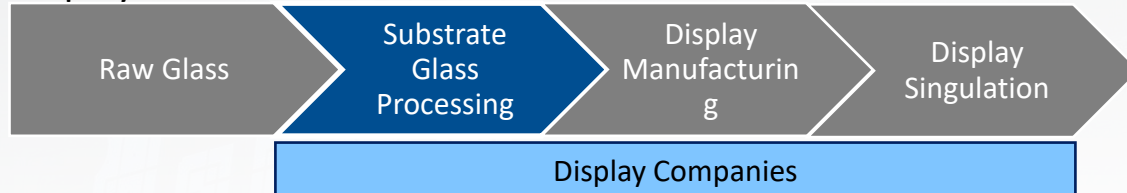
Electronics



Cover Glass



Display





» TWO PILLAR GROWTH STRATEGY

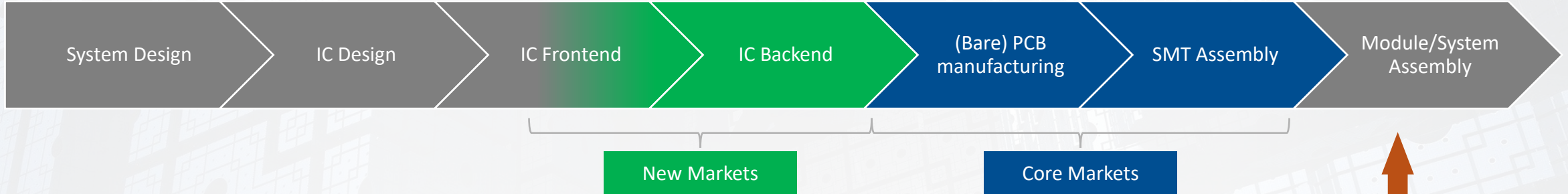
- 1. Grow Core Business**
Create superior customer benefit through technology edge

- 2. Enter new Markets and Applications**
Leverage core competencies to enter scalable new application fields

EXPANSION OF PRODUCT OFFERING



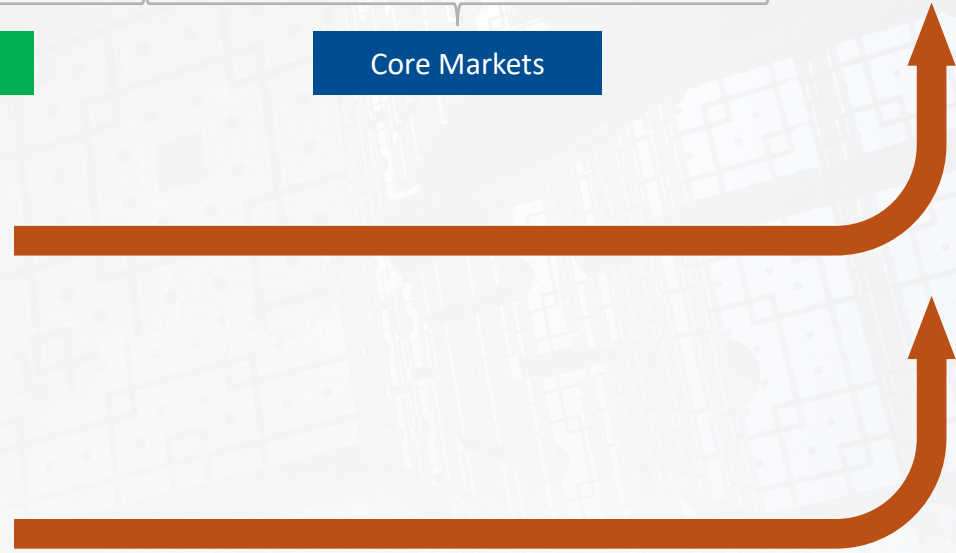
Electronics

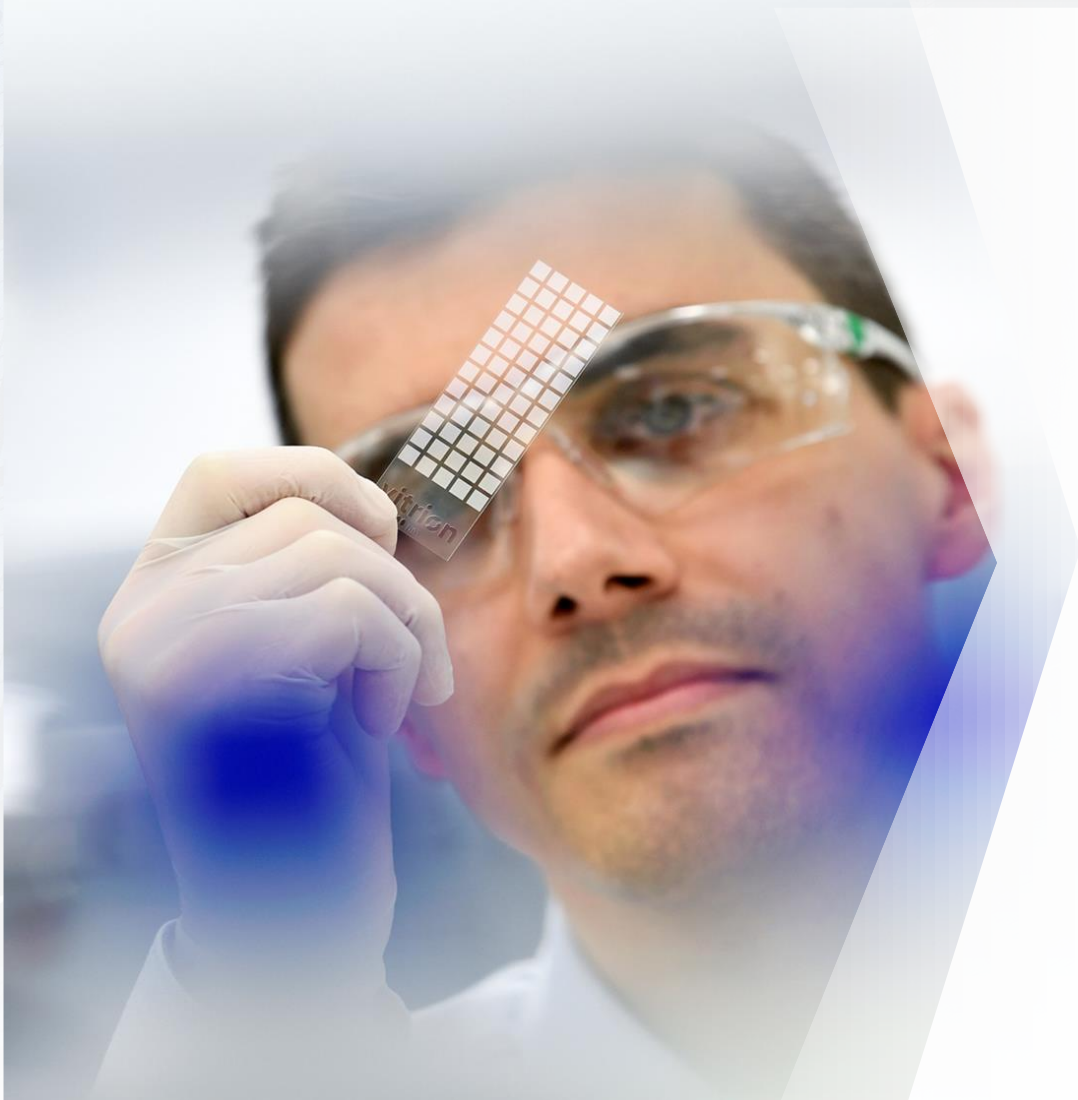


Cover Glass



Display





» TWO PILLAR GROWTH STRATEGY

- 1. Grow Core Business**
Create superior customer benefit through technology edge

→ *example: Laser Depaneling*
- 2. Enter new Markets and Applications**
Leverage core competencies to enter scalable new application fields

DEPANELING SOLUTIONS

LASER DEPANELING IS SUPERIOR IN EVERY TECHNICAL ASPECT



MECHANICAL METHODS

Mechanical Milling



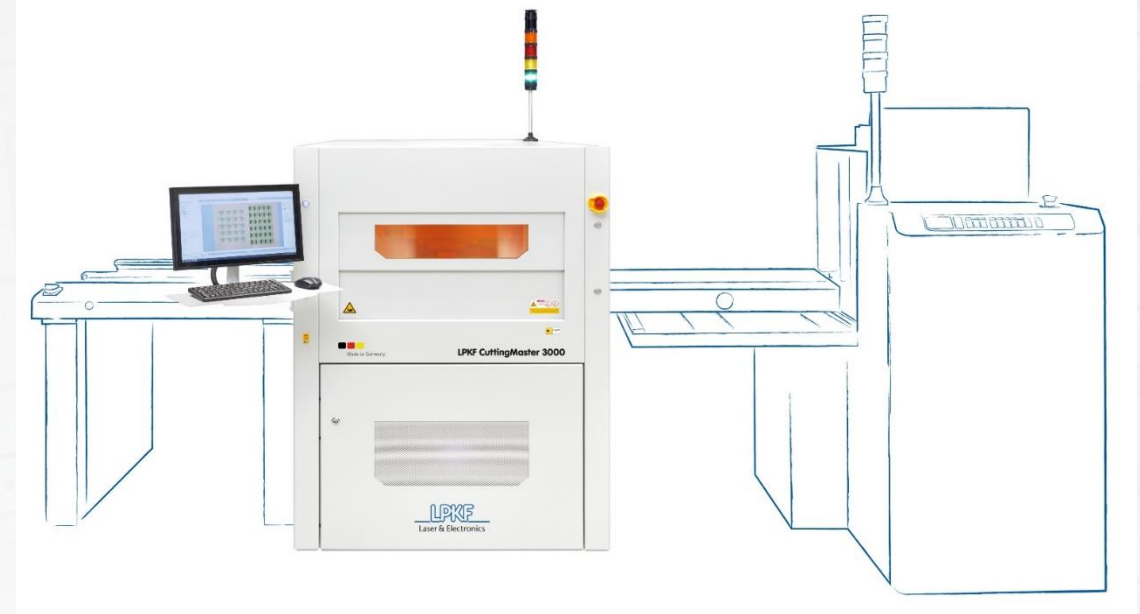
Die Punching

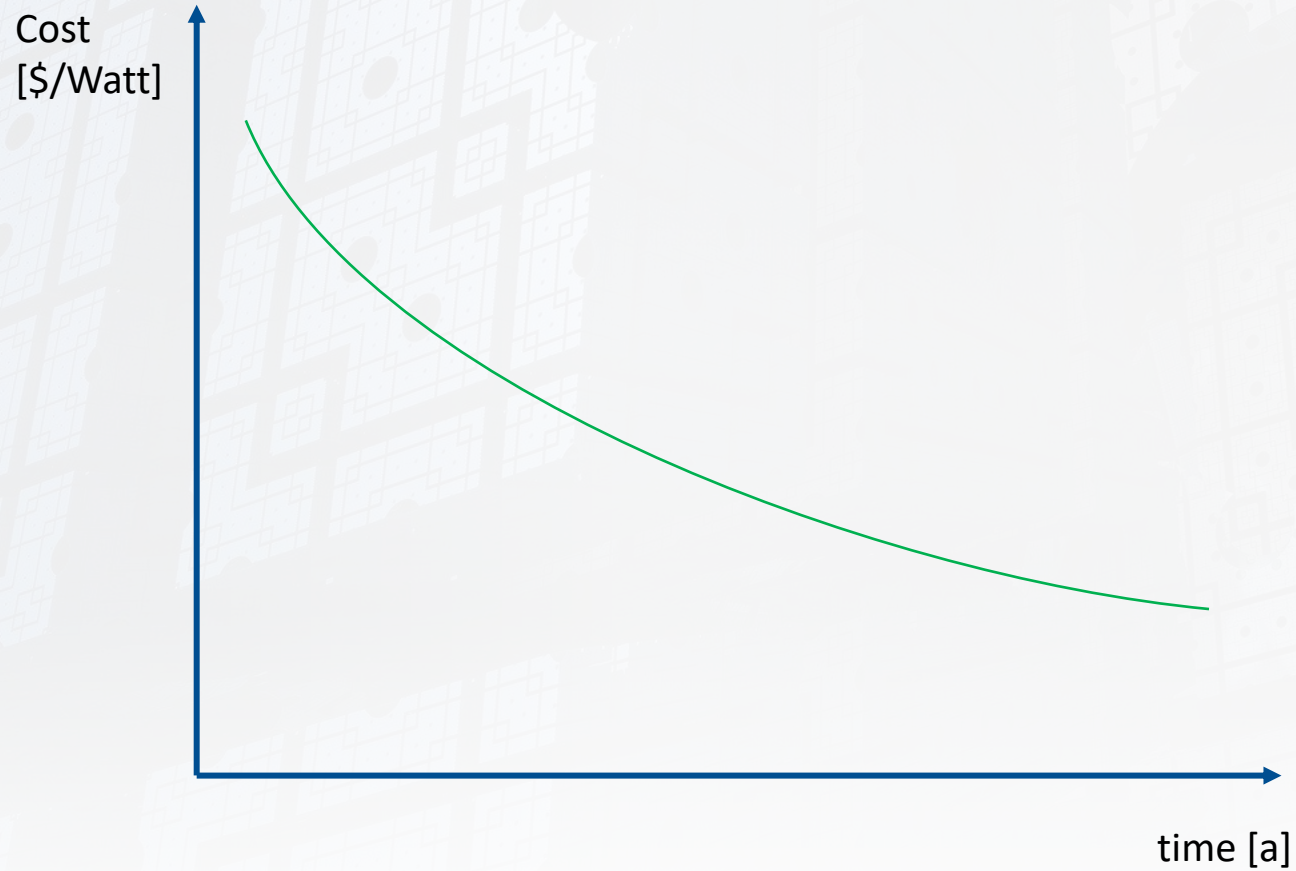


Pizza Cutter



LASER DEPANELING



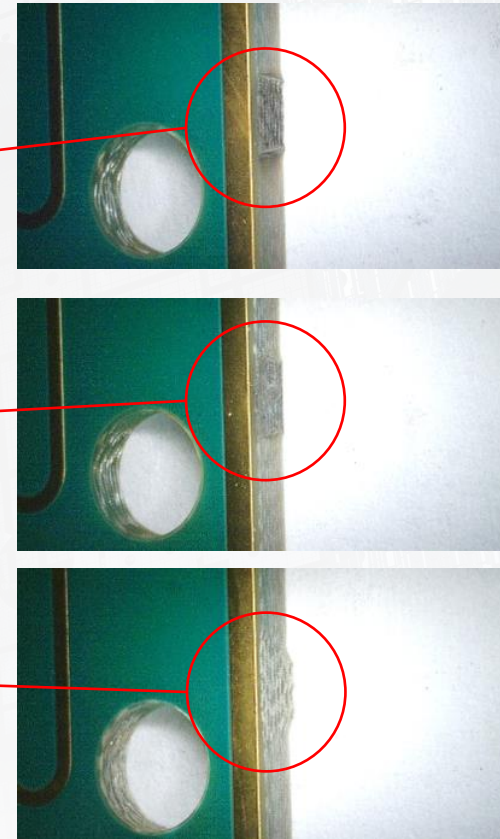
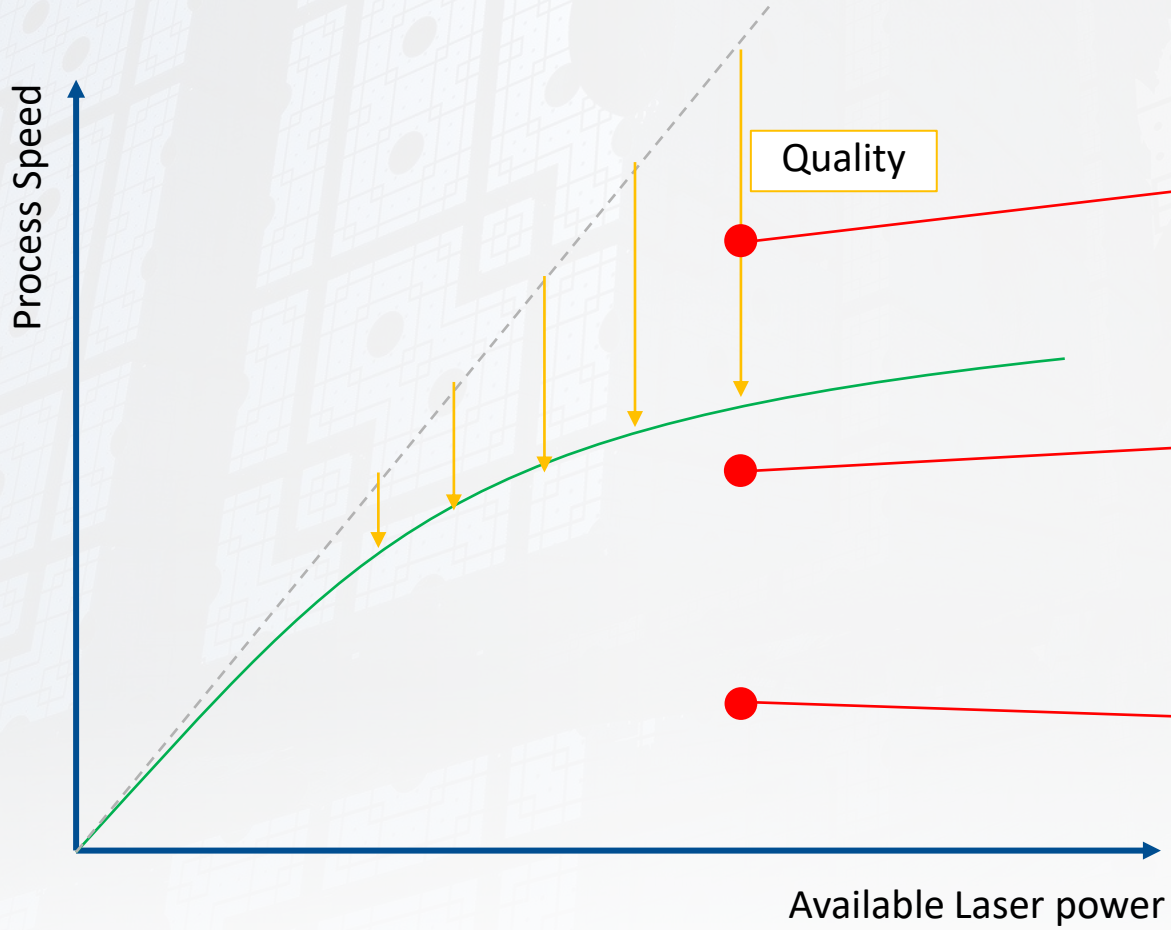


» COST LASER POWER

- Fundamental driver of laser material processing
- Available laser power becomes more cost efficient over time

LASER MICRO MATERIAL PROCESSING

QUALITY LIMITS SCALING OF MICRO PROCESSING WITH POWER



» QUALITY

- More power → more heat → impaired quality

TENSOR TECHNOLOGY

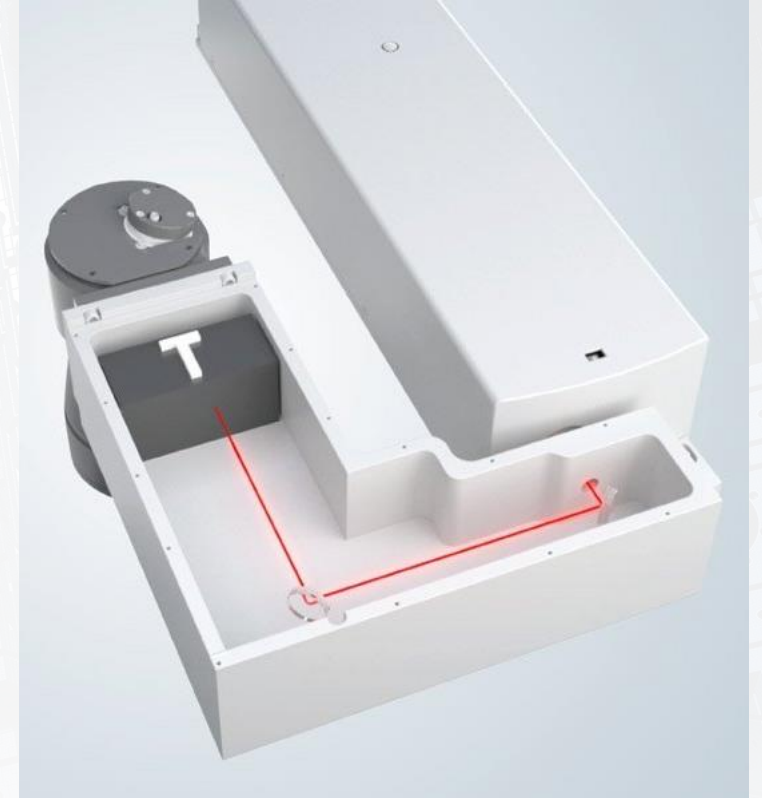
LPKF'S SOLUTION TO THE LASER POWER DILEMMA



- Approach: keeping quality at higher laser powers by high-speed beam deflection

LPKF Tensor

- Supplementary component of our beam delivery system
- Purpose: efficient and clean application of all of the available laser power
- Patented technology based on LPKF LIDE technology



CUTTINGMASTER 2240

LPKF'S FIRST PRODUCT INCORPORATING TENSOR TECHNOLOGY

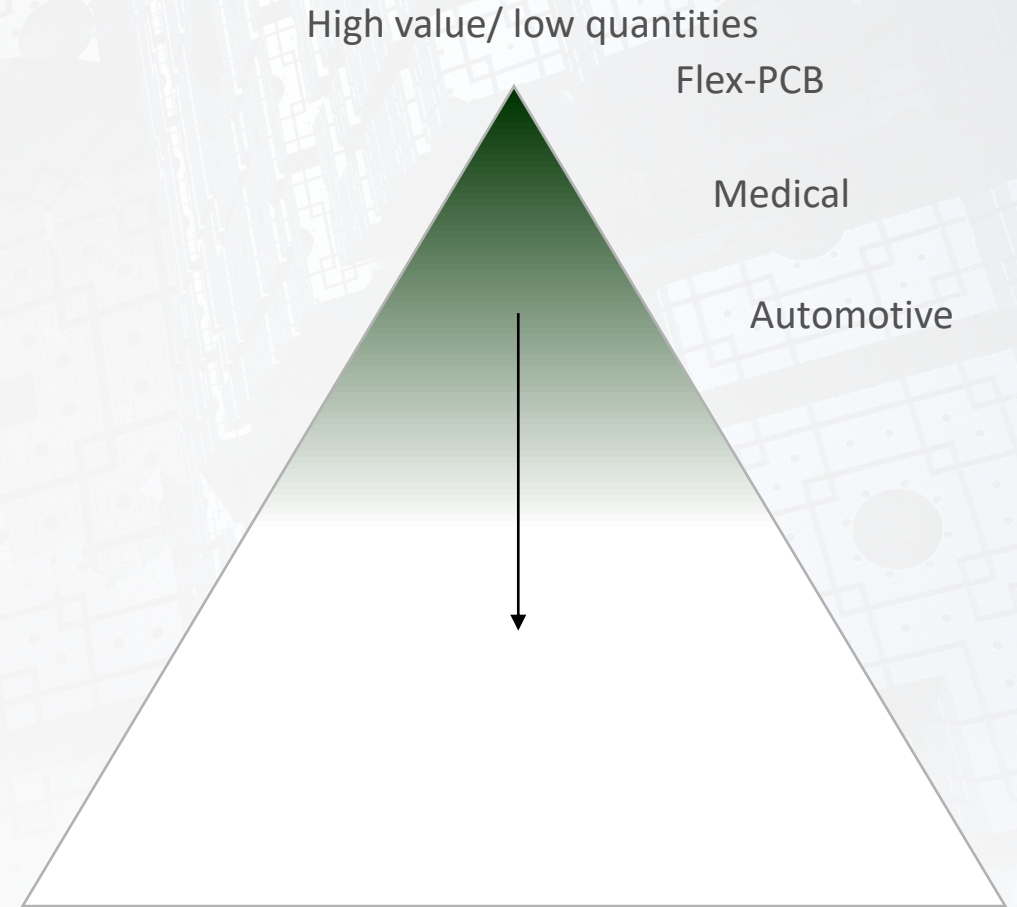
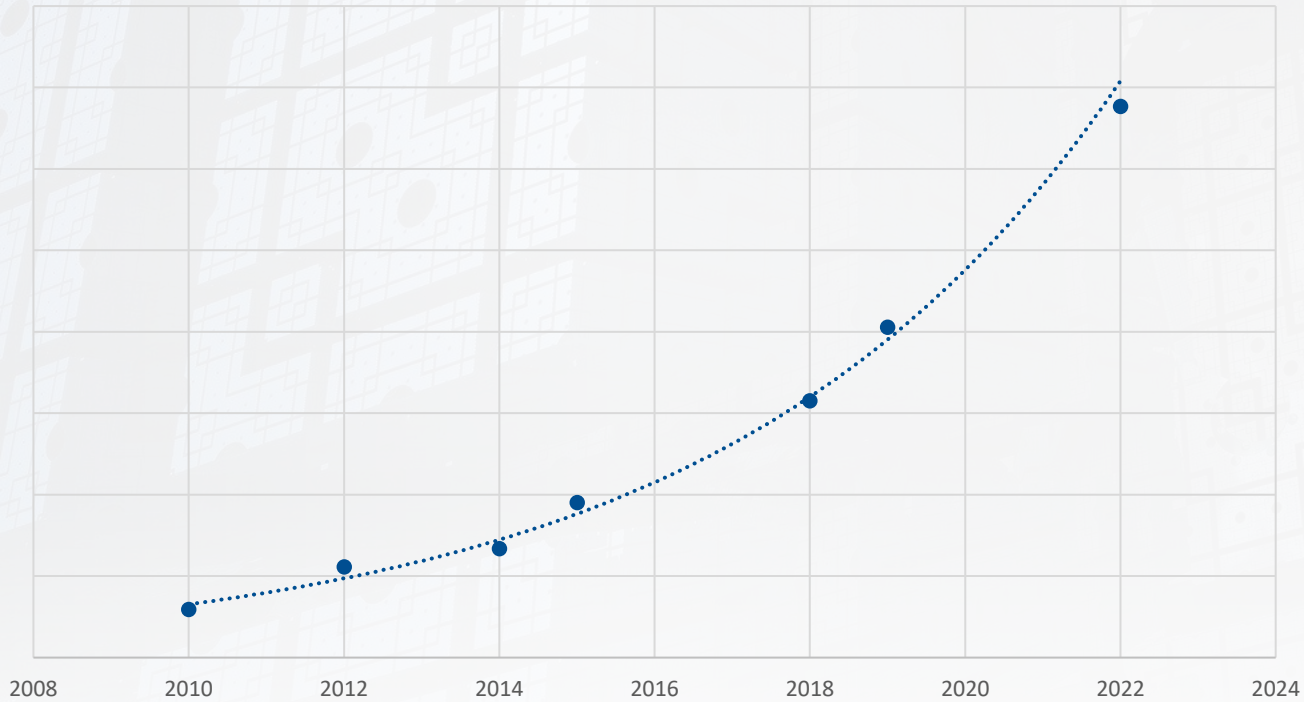


- Laser Depaneling Tool
- New product available since this year
- Up to 70% faster than competitors in the same performance class





Cutting Performance of Laser Depaneling Tool per Cost [mm/s/€]



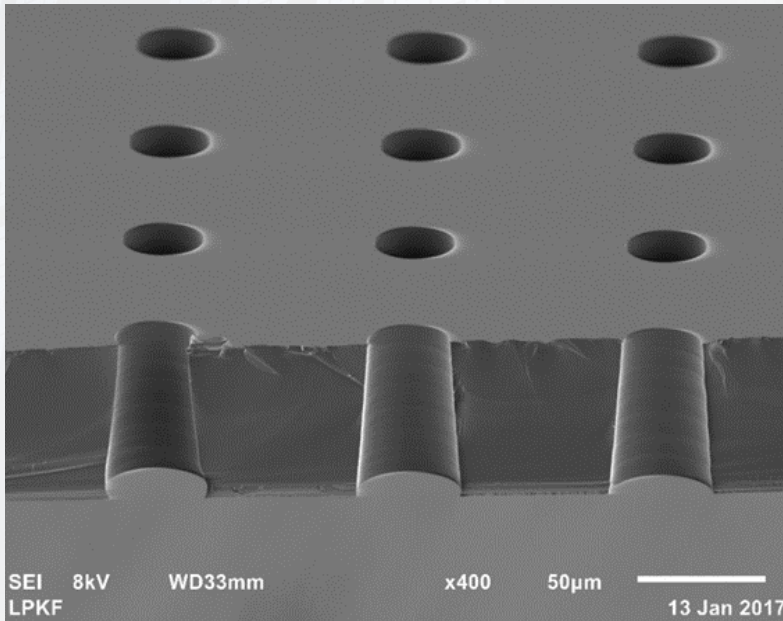


» TWO PILLAR GROWTH STRATEGY

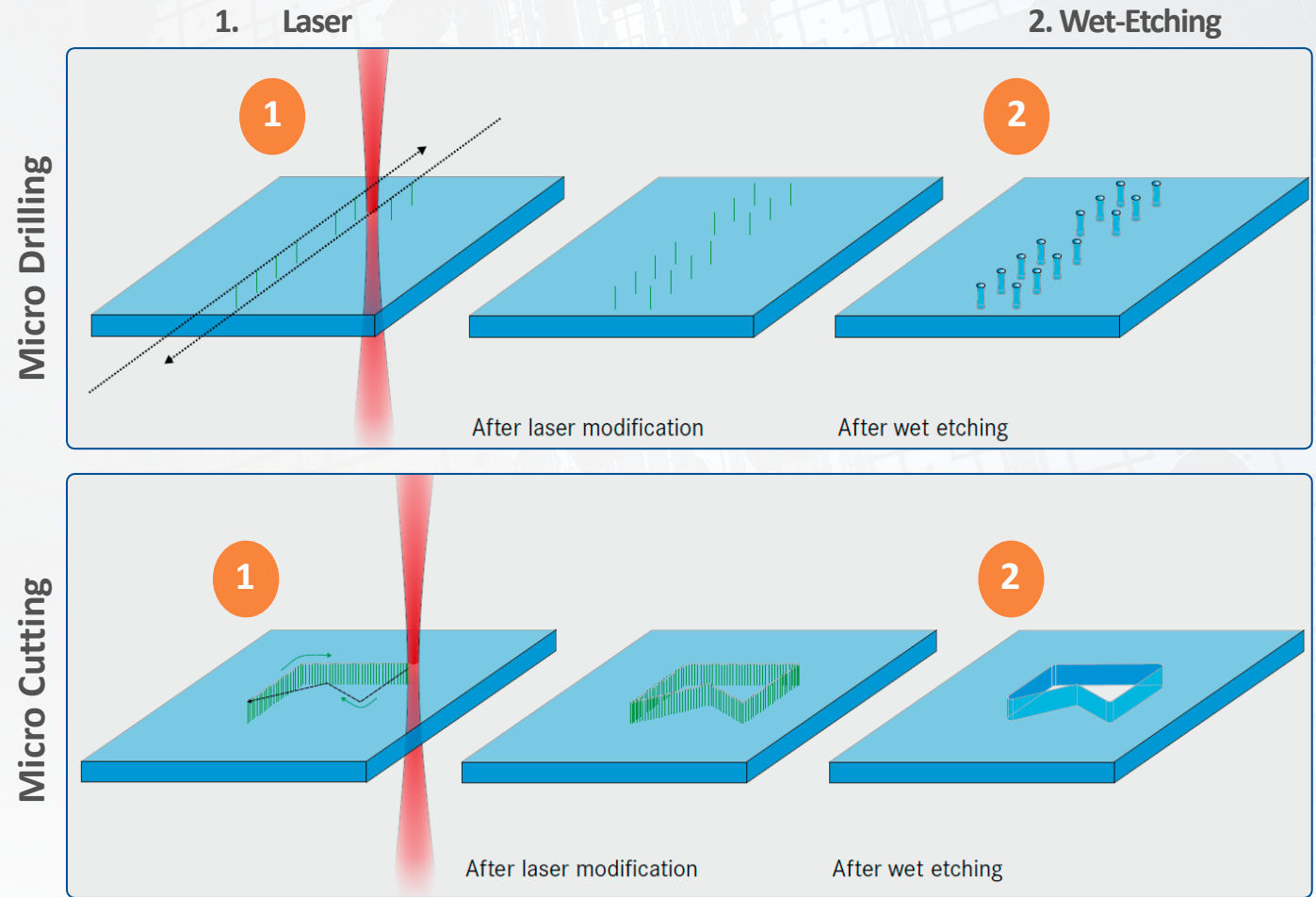
- 1. Grow Core Business**
Create superior customer benefit through technology edge

- 2. Enter new Markets and Applications**
Leverage core competencies to enter scalable new application fields

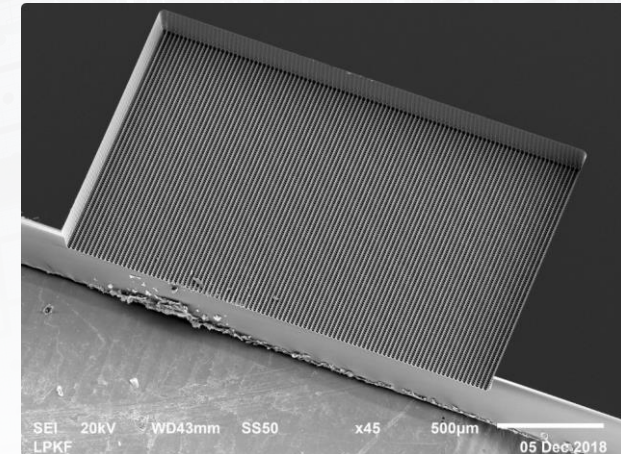
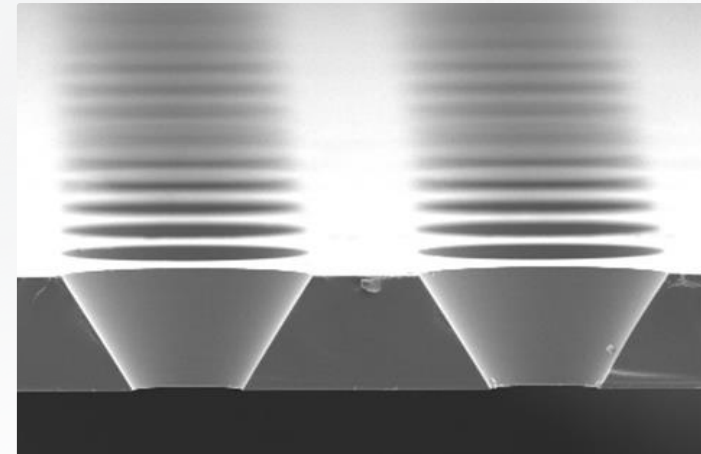
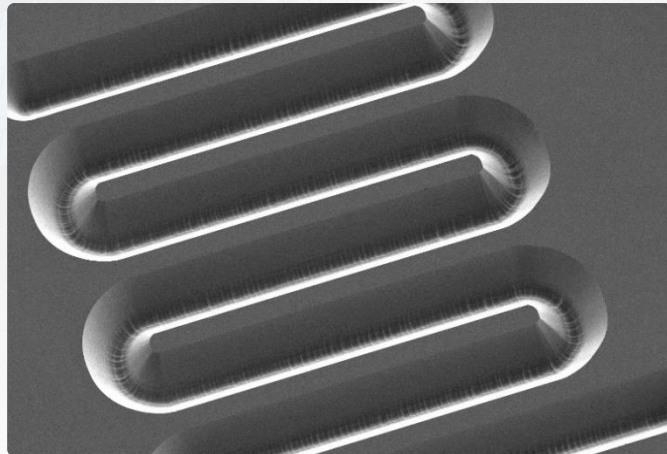
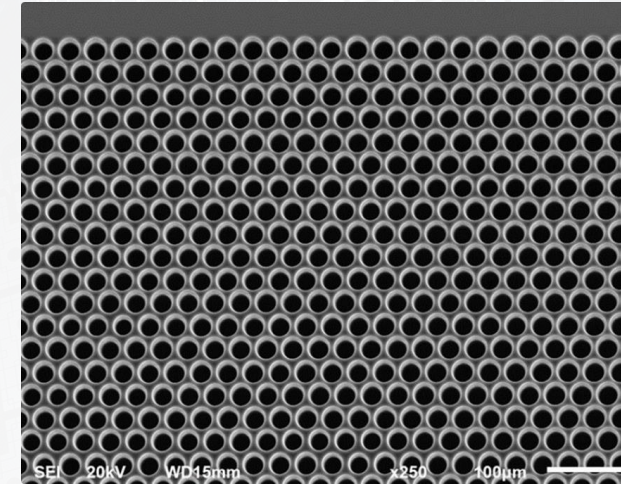
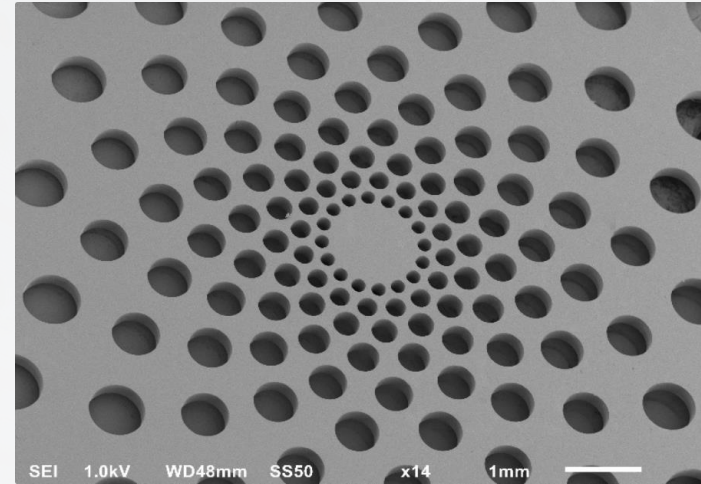
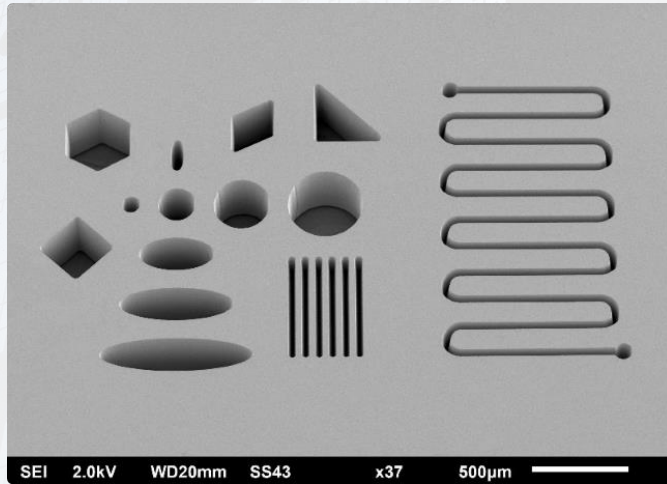
→ *example: Laser Induced Deep Etching*



Standard laser drilled holes manufactured by LIDE

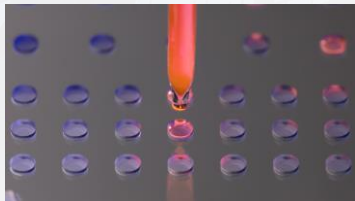
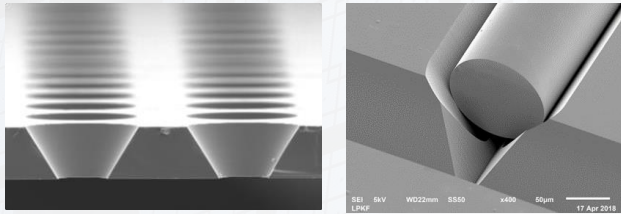


DEEP FEATURES IN THIN GLASS



LIDE COMMERCIALIZATION STRATEGY

WE ADAPT FLEXIBLY TO DIFFERENT CUSTOMER SEGMENTS AND APPLICATIONS



OEM Business

Manufacturing Service

LIDE Based Solutions

Applications

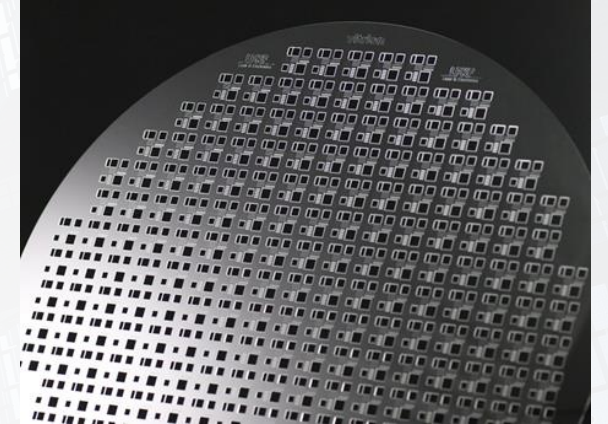
- Semiconductor
- Display
- Microfluidic Chip
- Wafer Level Optics
- e.g. ARRALYZE

SEMICONDUCTOR OEM BUSINESS

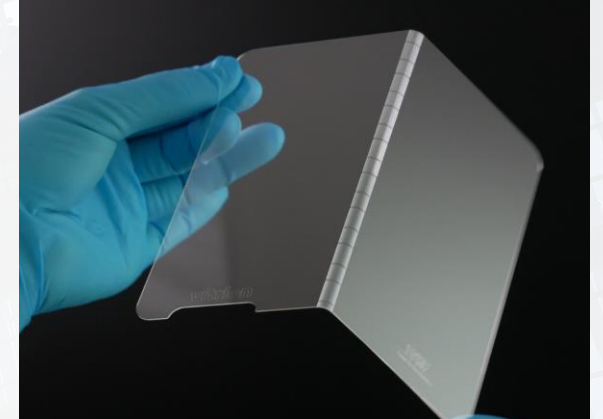
STATUS OF BUSINESS DEVELOPMENT



- First LIDE equipment delivered for mass production of wafer level packaging components
- Umbrella supply agreement concluded with major semiconductor OEM
- Multiple projects on TGV with major OEMs
- Projects on other application with major OEM



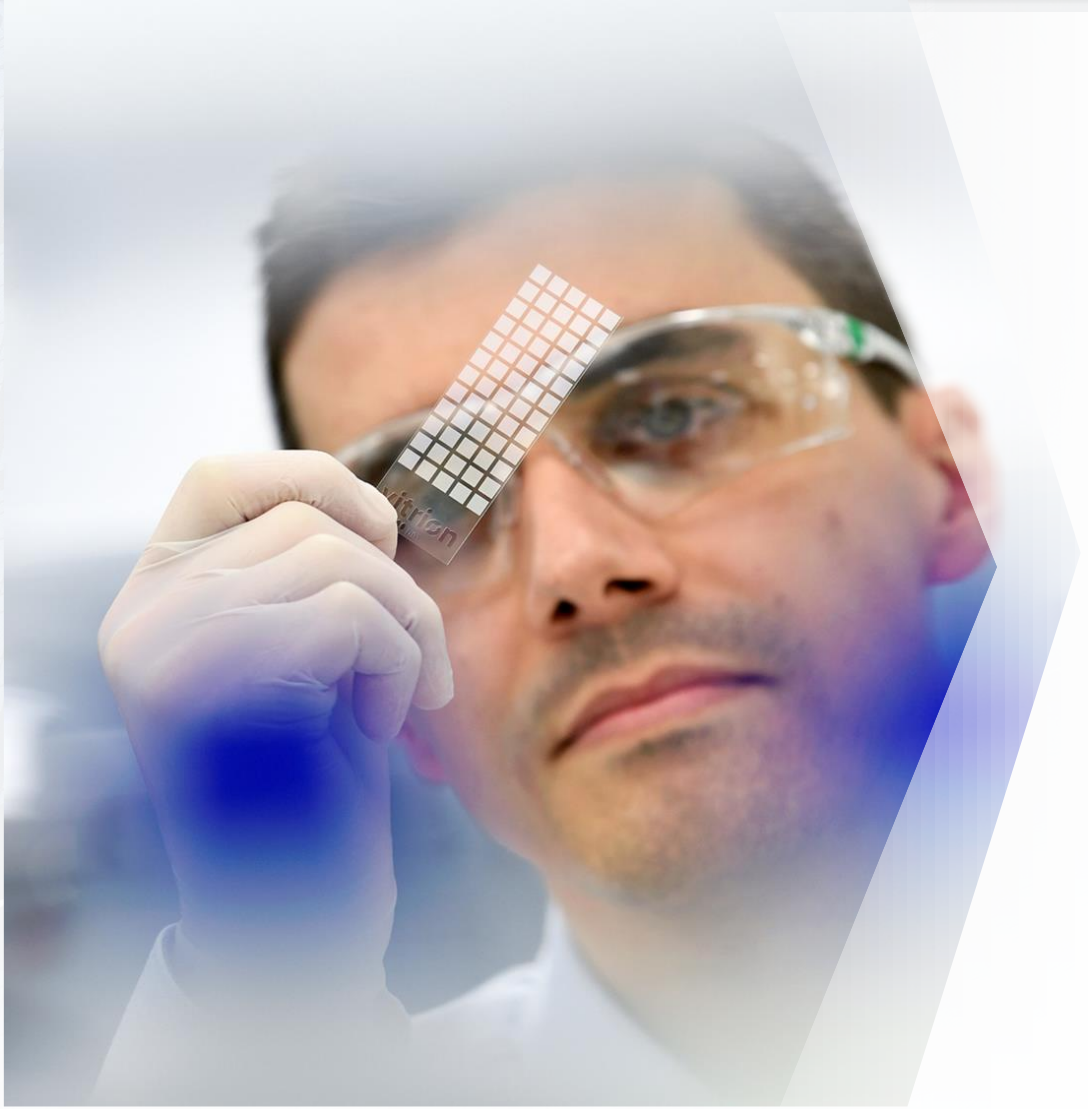
- First LIDE equipment delivered for production of display backplanes
- JDA with major mobile display manufacturer running
- Continued high sample rate





EXECUTIVE SUMMARY

KEY TAKE AWAYS ON BUSINESS UNIT EQ



- Broadened business and customer base in past years, growth in core business outside of the traditional consumer electronics key account
- Majority of sales with new product releases (<2 yrs old)
- Compelling growth case for advanced Depaneling applications
- LIDE reached stage of first manufacturing adaption – continued strong engagement with high potential OEMs



»» THANK YOU AND Q&A SESSION



BUSINESS UNIT

DEVELOPMENT

PRESENTED BY MRS. BRITTA SCHULZ

» BRITTA SCHULZ

BUSINESS UNIT MANAGEMENT DEVELOPMENT

- Trained in business administration
- Joined the LPKF Group in August 1996
- Started at LPKF as an export specialist
- Moved quickly in the direction of sales & marketing for the Development segment
- Learned entrepreneurial thinking and acting “on the job”
- Took over responsibility sales & marketing for the Development segment in 2004
- Became Managing Director for the Business Unit Development in 2010



» I see myself as an advocate for my customers – understand the needs and fulfill the expectations!

DEVELOPMENT AT A GLANCE

KEY FACTS



Location



Garbsen, Germany
Naklo, Slovenia



Employees



150
world wide

Main Markets

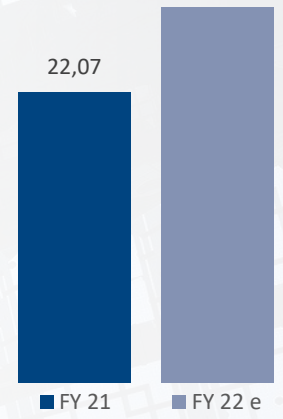
Electronics 	RF & Microwave 	Medical 	Life Science
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Market Offering

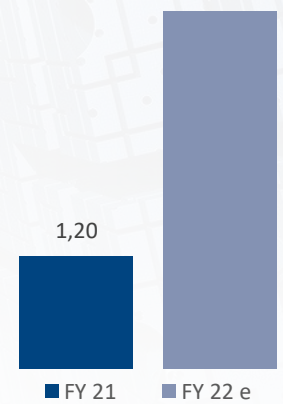
Rapid Prototyping & ARRALYZE

Equipment for Rapid Prototyping of Circuit Boards 	Equipment for Single Cell Analysis
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Revenue 2021 – 2022e in mn €

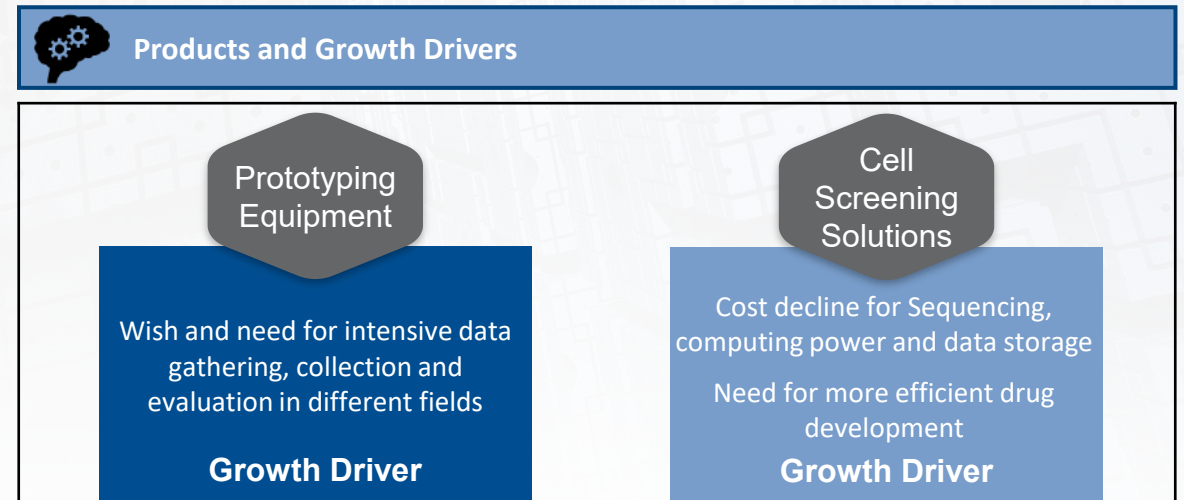
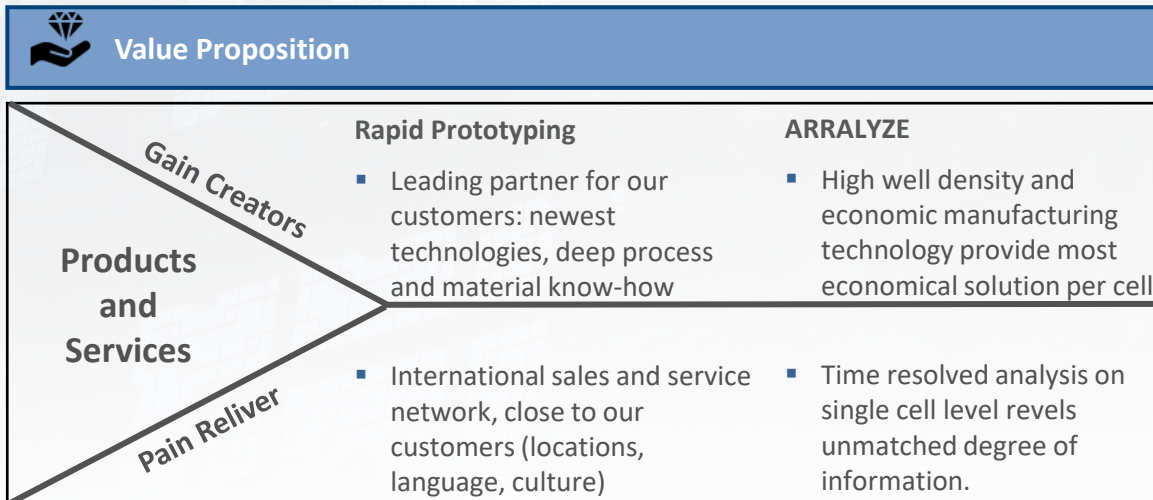
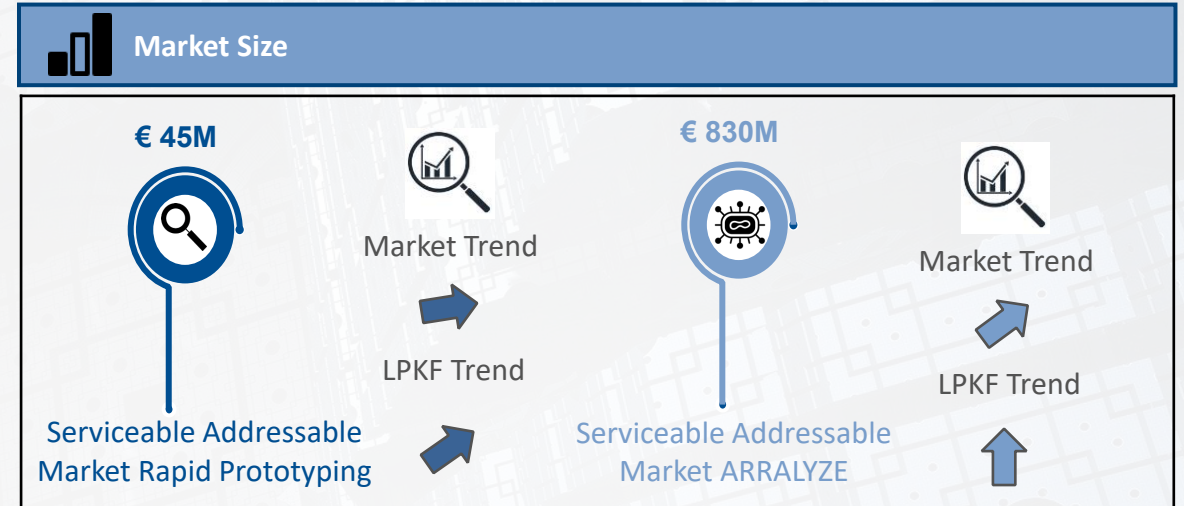
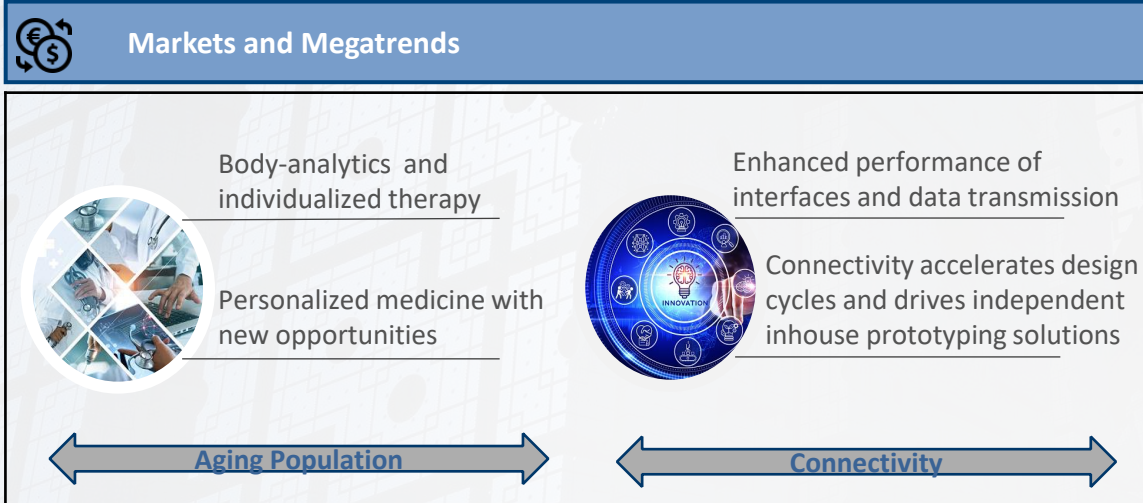


EBIT 2021 – 2022e in mn €



BUSINESS UNIT DEVELOPMENT

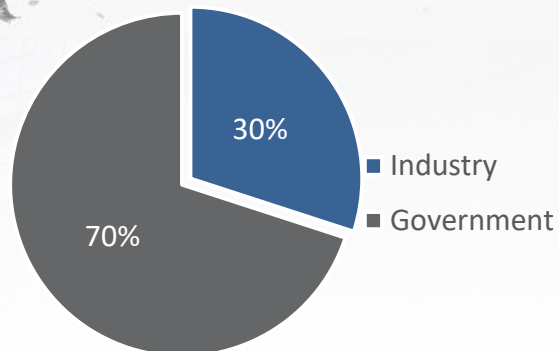
MARKETS AND VALUE PROPOSITION



WORLDWIDE MARKET



CUSTOMER TYPES



CHALLENGE FOR CUSTOMERS

WHY RAPID PROTOTYPING?

- **Time to market:** increasing time pressure
- **Security:** protection of design layout / IP
- **Flexibility:** several iteration steps necessary
- **Quality:** high expectations towards geometric accuracy
- **No waste:** proof of concept before investment
- **Plannable costs:** internal order handling
- **Autonomous responsibility:** maintain control of process
- **No chemicals:** environmental awareness

HIGH-END LASER TOOL

1. Focusing on further development of special applications

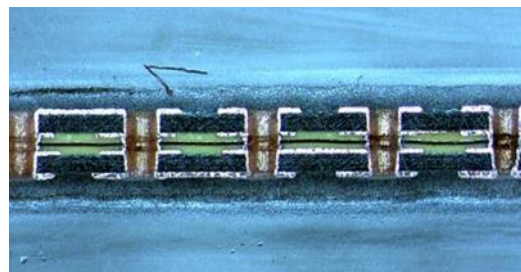
- Market access given (Institutes)
- Further development of new markets (Medical)
- Focus on researchers



ProtoLaser R4



ProtoLaser R4 Glass Processing



MultiPress S4 Flex Substrate Multilayer

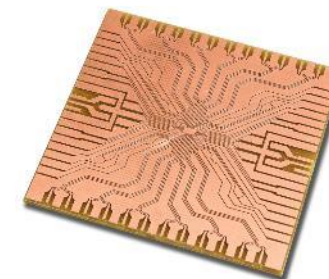
LOW-END LASER TOOL

2. Protecting established PCB Prototyping applications

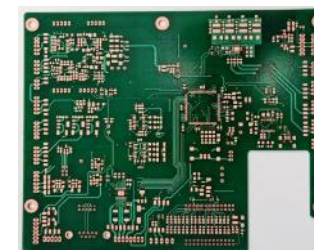
- Establish laser tool as standard
- Simplify processes
- Focus on budget buyers



ProtoLaser H4



HDI Board on FR4



FR4 PCB with Finishing

LATEST DEVELOPMENT



COMPETITIVE ADVANTAGE

- Process know-how
- Material know-how
- International network
- LPKF Brand
- Complete Line
- Flexibility
- Independence
- Confidentiality



NEW BUSINESS INITIATIVE

ARRALYZE

PRESENTED BY DR. ROBIN A. KRÜGER

» DR. ROBIN A. KRUEGER

VICE PRESIDENT ARRALYZE

- Studied Chemistry and Biochemistry at Philipps-University Marburg 1999-2008
- Dipl.-Chem. Philipps-University Marburg 2005
- Dr. rer. nat. Philipps-University Marburg 2008
- PostDoc University of Calgary/Canada 2008-2011
- Joined LPKF as Research Scientist in 2011
- Project Leader in Group Technology Management 2014–2018
- Department Manager Group Development Innovation 2018-2020
- Vice President ARRALYZE since April 2020



» Every tumor is unique, and with ARRALYZE we will enable our customers to make groundbreaking discoveries towards personalized medicine.

Applications that require to screen single cells:



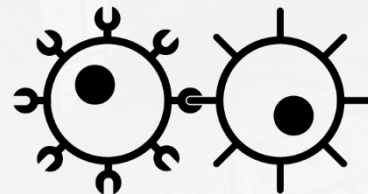
CLD



SynBio

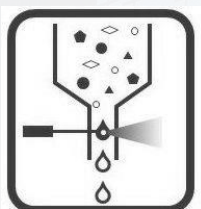


mAb

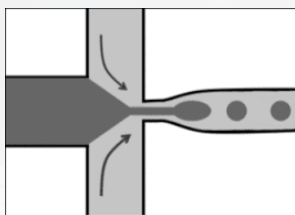


Cell Therapy

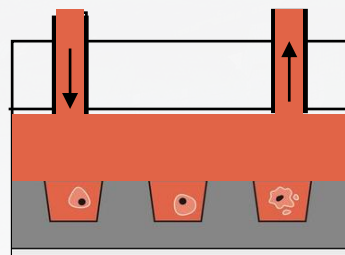
Common technologies for single cell screening:



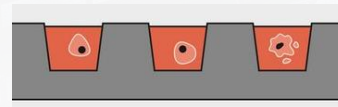
Cytometry



Droplet technology



Enclosed wells



Open wells

What makes a good cell screening technology:

- allows for large numbers of cells per experiment
- low cost per cell
- gentle to cell
- as close to *in-vivo* as possible
- allows for functional assays
- easy to use

Efficiency

Need for more efficient drug development

1

Personalized Medicine

Approaches towards personalized medicine

3

Globalization

Initiatives such as the human cell atlas project

5

Cost Decline

Cost decline for sequencing, computing power and data storage

Microsystems Technology

Progress in microsystem technologies

ARRALYZE's Solutions

- Best cost/cell
- Seamless and automated process
- Deeper analysis on single cell level
- Shortening time of discovery
- Isolating hits alive

»» ARRALYZE is a Digital Cell Biology Platform for Discovery, Development and Delivering of Cell-Based Products.

Dispensing Single Cells

- single cell experiments
- high well density
- small volume
- customizable arrays

Live Cell Imaging

- 3 fluorescent channels
- brightfield
- phase contrast
- functional assays
- prove monoclonality


Cell Extraction

- Isolate leads alive

APPLICATIONS

- Cell Therapy
- Monoclonal Antibodies
- Cell Line Development
- Synthetic Biology
- more to come ...

CUSTOMER

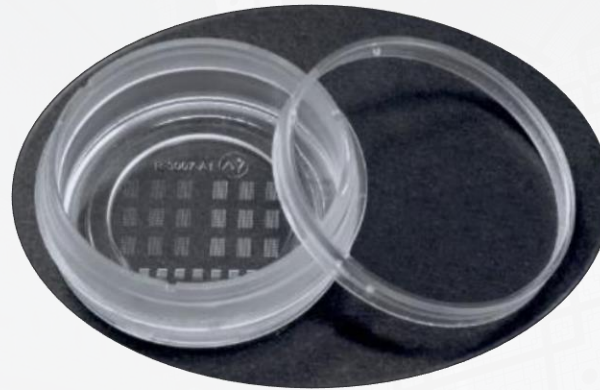
-  Academics
-  Biotech Companies
-  Pharmaceutical Companies

Equipment



- CellShepherd®
- Stand-alone workstation
- Dispensing, imaging and isolation of cells

Consumables



- Standardized arrays
- Customizable arrays
- Works seamlessly with CellShepherd®

Software



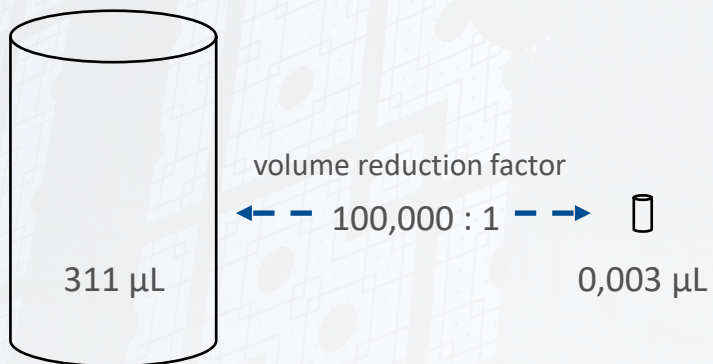
- Basic software licence
- Sophisticated software routines
- Specialized machine learning algorithms

Development of a holistic product portfolio

THE COMPETITIVE ADVANTAGE OF ARRALYZE



Miniaturizing saves costly chemistry

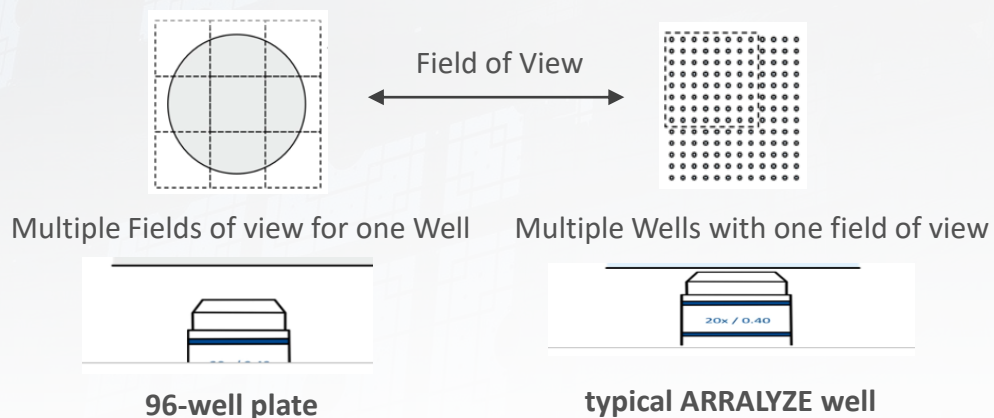


Miniaturizing enables to screen huge populations



Screening 1,000,000 single cells would require at least 104,417 x 96 well plates vs. one ARRALYZE array with standard format

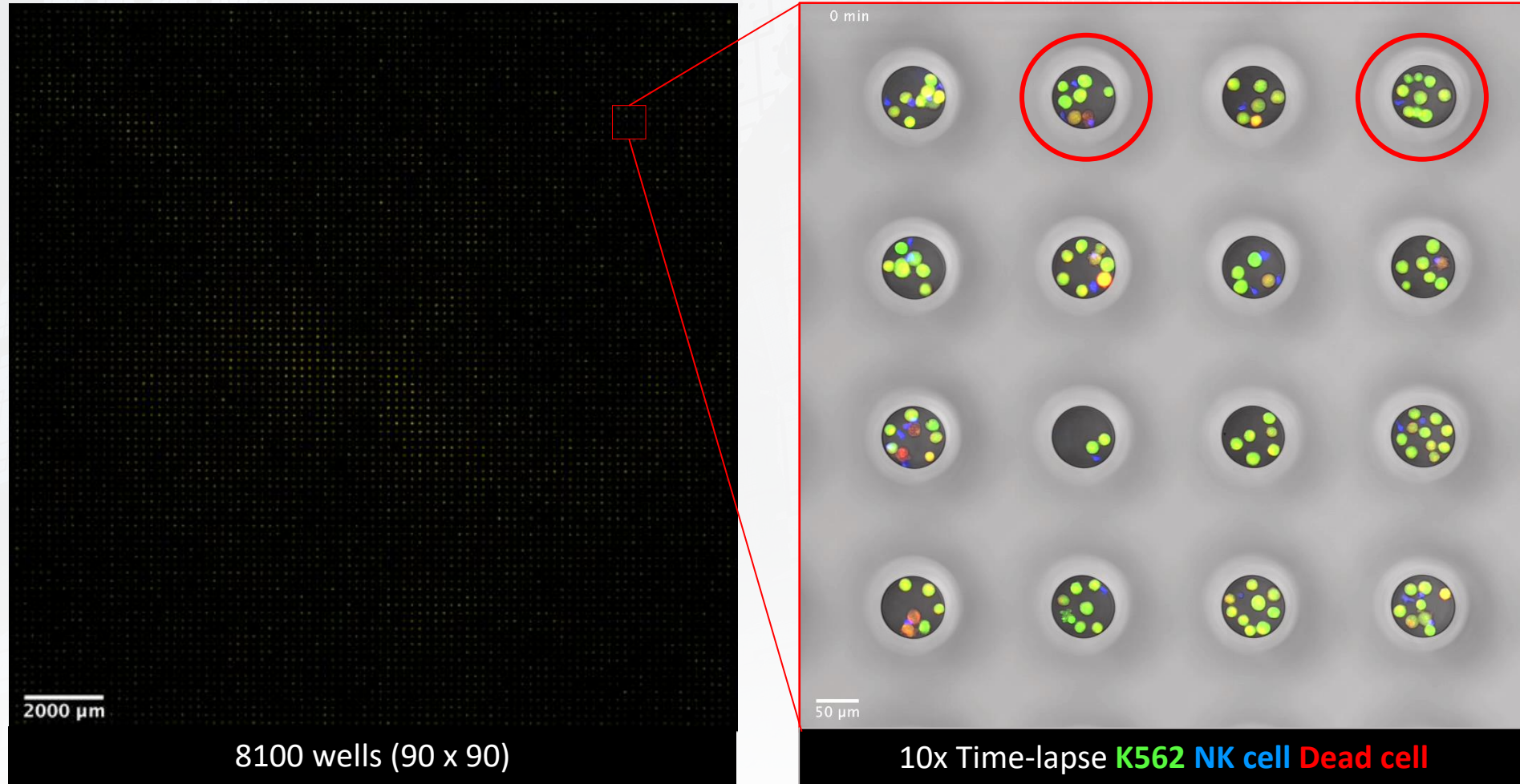
Miniaturizing allows to find cells faster in 3D scans

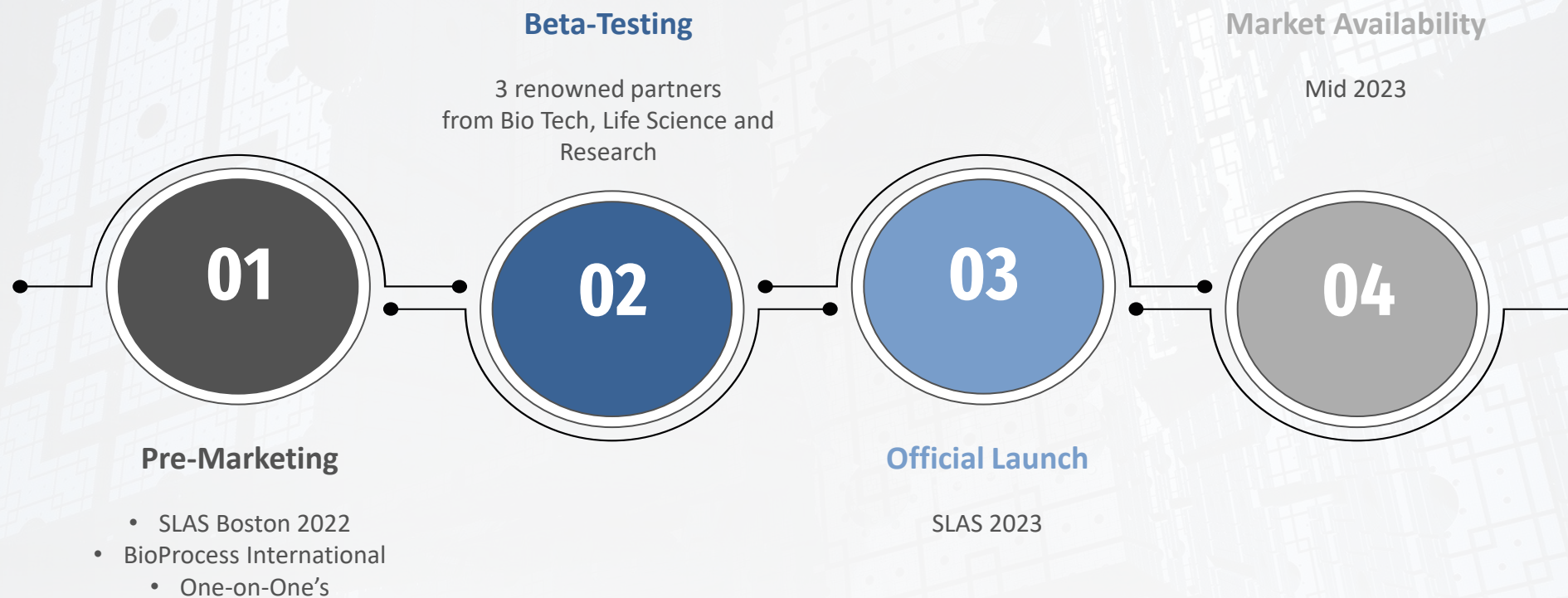


Miniaturization makes it possible to find better cells in larger populations faster and at a lower cost per cell

- Miniaturization offers the potential for massive cost reduction through the use of less of a very costly chemistry
- Miniaturization allows to screen huge populations on small footprint
- Miniaturization enables faster screening of wells in 2D and 3D, thus significantly increasing throughput

DEMONSTRATION: NK-KILLING ASSAY





What might delay plan:

- Still in development – remaining technological risks
 - Availability of components
 - Downturn of economy in 2023



»» THANK YOU AND Q&A SESSION

A photograph of two men in a server room. They are looking at a piece of equipment with several yellow wheels. The room is dimly lit with blue and purple light. The man on the left is pointing at the equipment. The man on the right is looking at the camera. The background shows server racks and other equipment.

BUSINESS UNIT
SOLAR

PRESENTED BY MR. JUERGEN BERGEDIECK

» JÜRGEN BERGEDIECK

BUSINESS UNIT MANAGEMENT SOLAR

- Studied mechanical engineering
- Started as an application engineer at an injection molding machine manufacturer
- Moved to international sales
- Took the lead for total order processing
- Took over responsibility for a business unit
- Joined LPKF in 2006
- Became Managing Director for the Business Unit Solar in 2007 and has developed the solar business since then



» We find solutions to improve productivity

BUSINESS UNIT SOLAR

KEY FACTS



Location



Suhl,
Germany



Employees



130
world wide

Main Markets

Thin film solar



Transportation

Architecture



Market Offering

Allegro



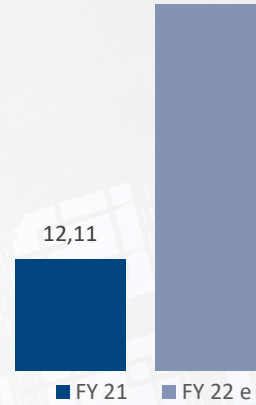
Novaprint



Presto



Revenue 2021 – 2022e in mn €



EBIT 2021 – 2022e in mn €



Markets and Megatrends

Markets

- Green Energy: Strong growth in solar module production leads to increasing demand
- Strong tendency for independence from dominant suppliers will lead to production capacity outside China



Carbon Neutrality

Carbon Neutrality drives solar share in total global electricity generation and investment programs

Market Size

€ 42M



Serviceable Addressable Market Solar



Market Trend



LPKF Trend



€ 21M



Serviceable Addressable Market LTP



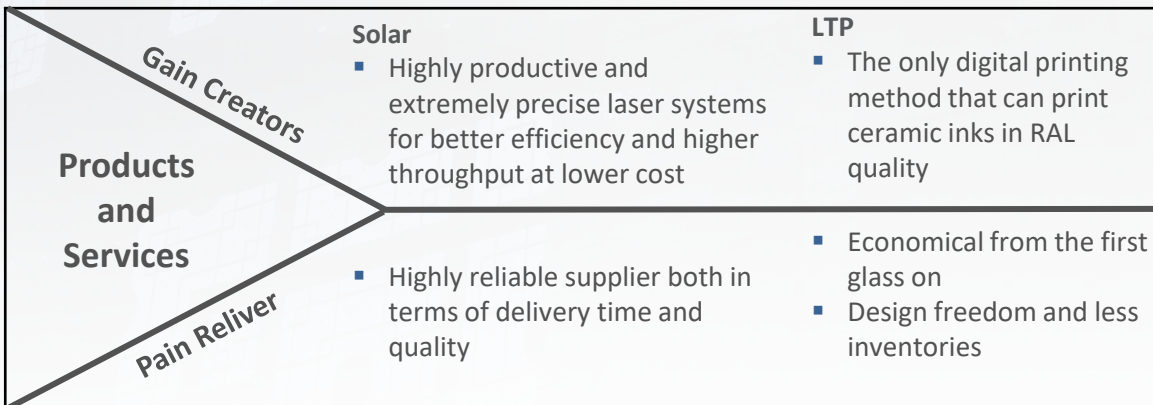
Market Trend



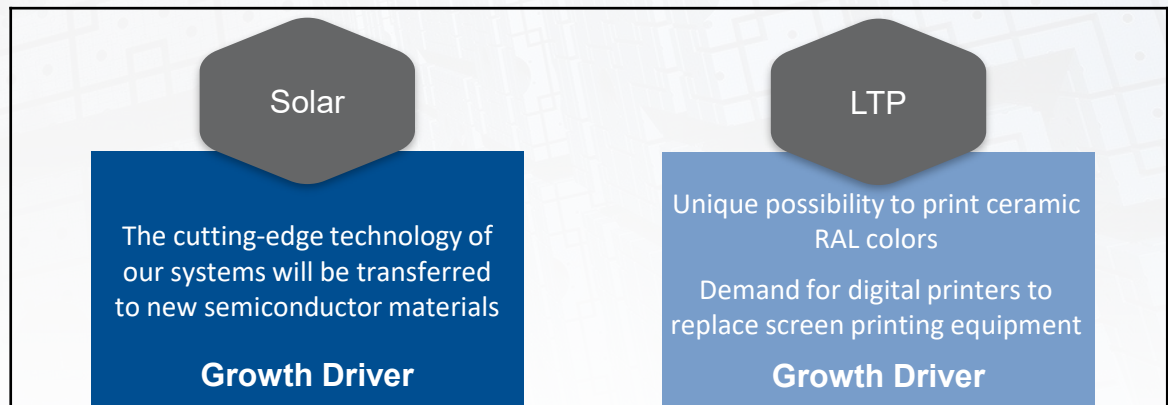
LPKF Trend



Value Proposition



Products and Growth Drivers



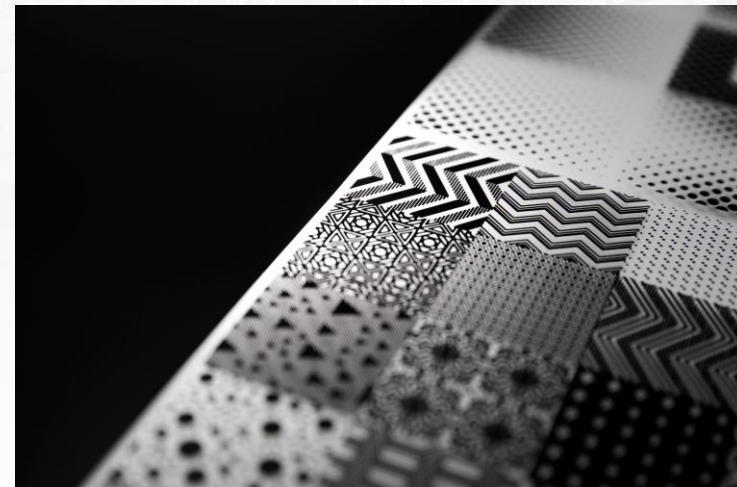
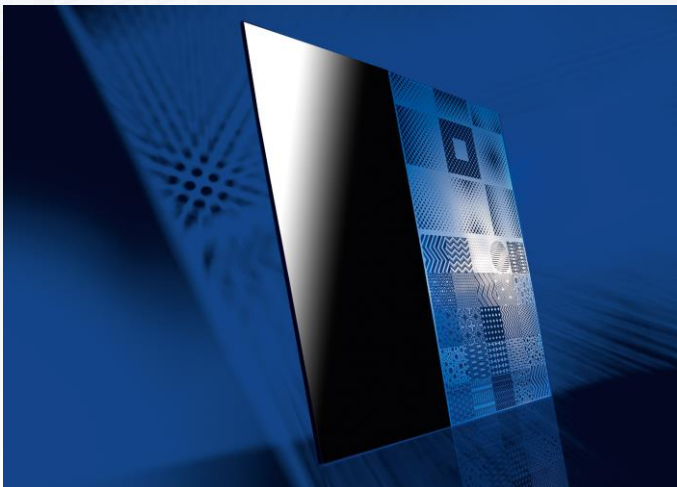
- Solar market passed the 1 TW threshold of installations in May 2022
- It took 16 years to install 500GW but only a little more than 3 years to double this value
- Solar power Europe predicts global solar to more than double to 2.3TW in 2025
- The share of thin film solar is stable in a growing market
- Additional opportunities due to Perovskite semiconductor materials entering the thin film market
- Perovskite technology offers higher potential efficiencies at lower cost giving the potential of an increased share of thin film at the total solar market

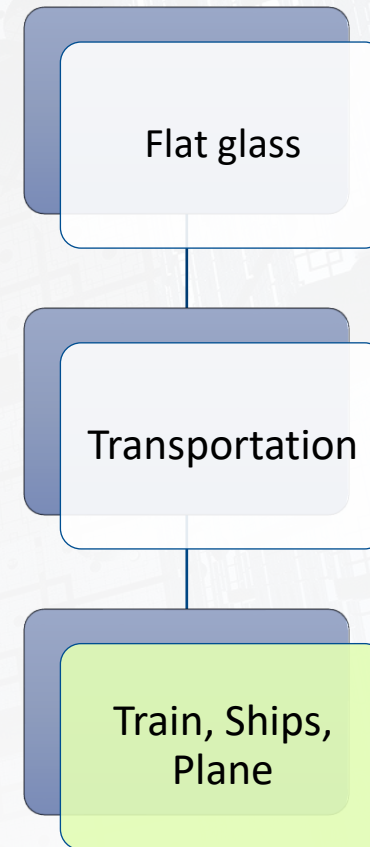
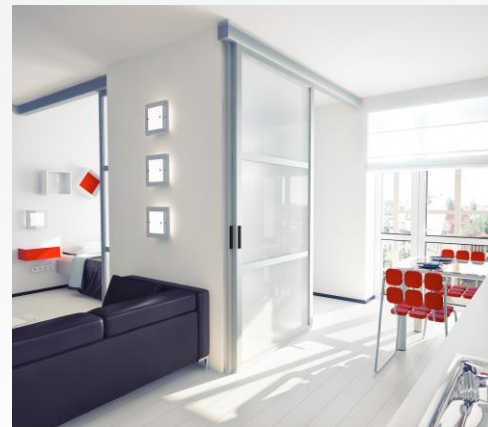
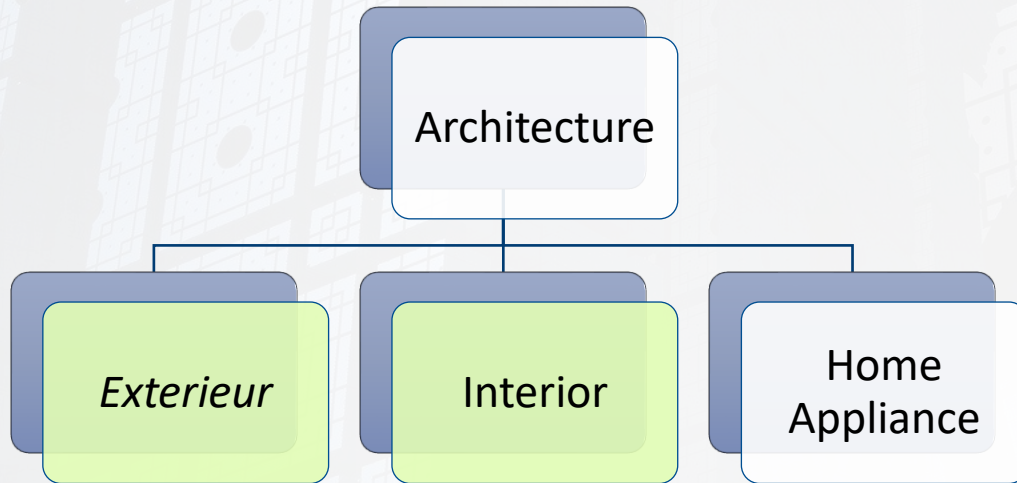


- Highly productive systems offering short cycle times on large formats are in the market
- Productivity increase with latest generation: 40%
- Reduction of dead zone with latest generation: 15%
- The technology platform for CdTe serves disruptive technologies such as Perovskite semiconductor materials in the same way

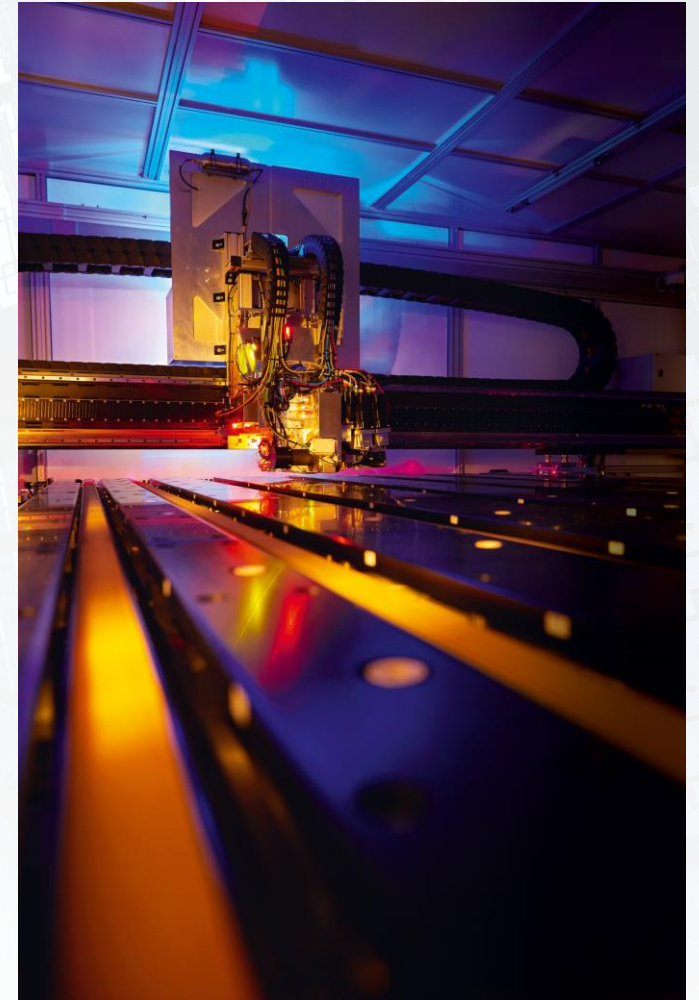


- **Laser Transfer Printing** is the digital printing solution for ceramic inks
- Market introduction of the new Novaprint machine at Glasstech 2022





- LTP is the only digital printing process to produce color fastness
- Guaranteed comparability of color shades to analog printing processes (screen printing, roller coater)
- Layer thicknesses up to 80 μm in one printing process - Inkjet applies 1 μm per print process
- Flexibility in the architectural field is unique
- Fast model changeover without time-consuming machine setup





»» THANK YOU AND Q&A SESSION

A photograph of two men in a trading room. The man in the foreground is looking intently at a tablet computer he is holding. The man in the background is also looking at the tablet, with his hand pointing towards the screen. The background is slightly blurred, showing what appears to be a trading floor with multiple computer monitors.

CURRENT TRADING & FINANCIALS

PRESENTED BY DR. KLAUS FIEDLER AND CHRISTIAN WITT

CURRENT TRADING

MARKET DEVELOPMENT & ENVIRONMENT



- Electronic Manufacturing Market slow due to component shortage and market uncertainty
- China lockdown slowed down regional order intake and sales
- Strong demand in Prototyping, Solar, Battery Packs and Medical
- Some cautiousness at customer side to implement disruptive changes in supply chain

- Good market response to new product launches (e.g., Tensor Systems, Prototyping)
- LIDE now in operation for low volume applications, development projects with high volume customers on track
- ARRALYZE test phase with three beta customers in H2/2022

- Ukraine war: no direct impact yet, but global economic slowdown will affect our markets
- Shortage in key components causes delays, but no disruption
- Further increase in working capital to ensure delivery security
- China's zero-COVID policy repeatedly caused closures of critical infrastructure



Market Situation



Business Development



Supply Chain

ENHANCED SALES AND RESULTS IN 2022

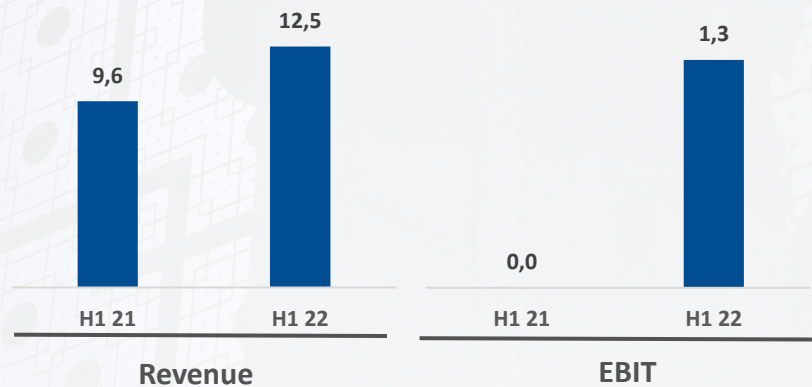
PROFITABILITY DRIVEN BY SALES; INFLATION ROLLED OVER IN PRICING



DEVELOPMENT

Growth 22 from strong product portfolio and global market trend.

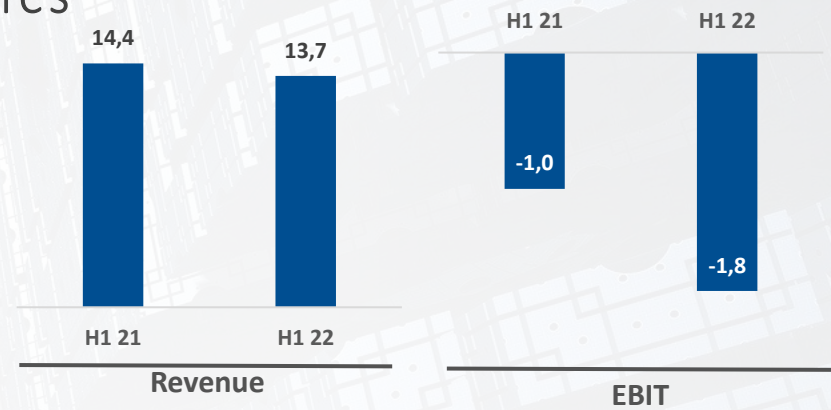
EBIT driven by volume, and build up of ARRALYZE



ELECTRONICS

Challenging market conditions in Consumer Electronics mostly compensated by new product introductions and first LIDE sales

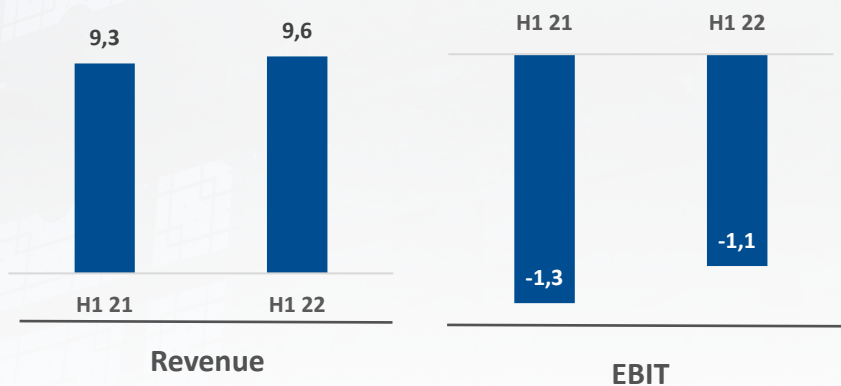
EBIT driven by volume and build up of LIDE



WELDING

Weak Consumer Electronics fully compensated by additional sales in E-Mobility and Medical

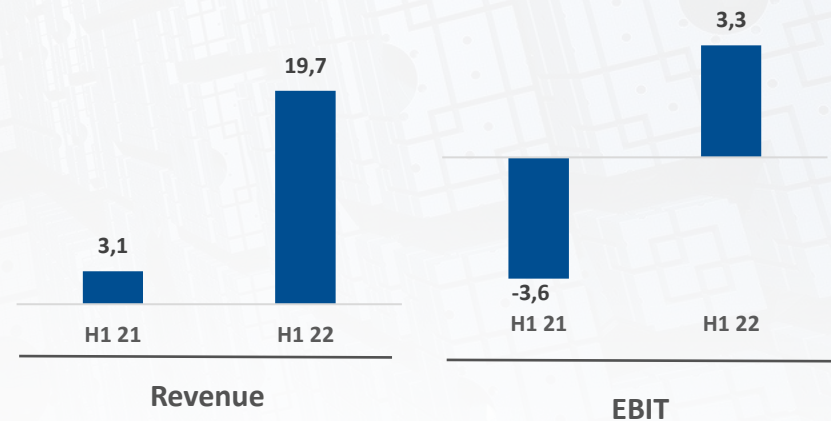
EBIT driven by volume and value pricing.



SOLAR

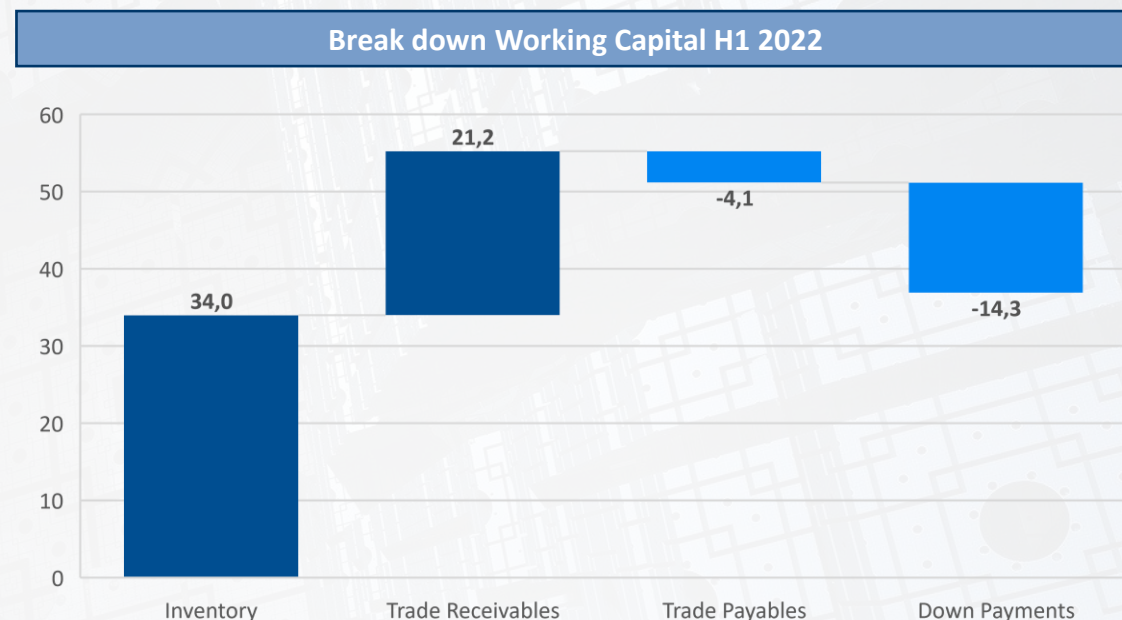
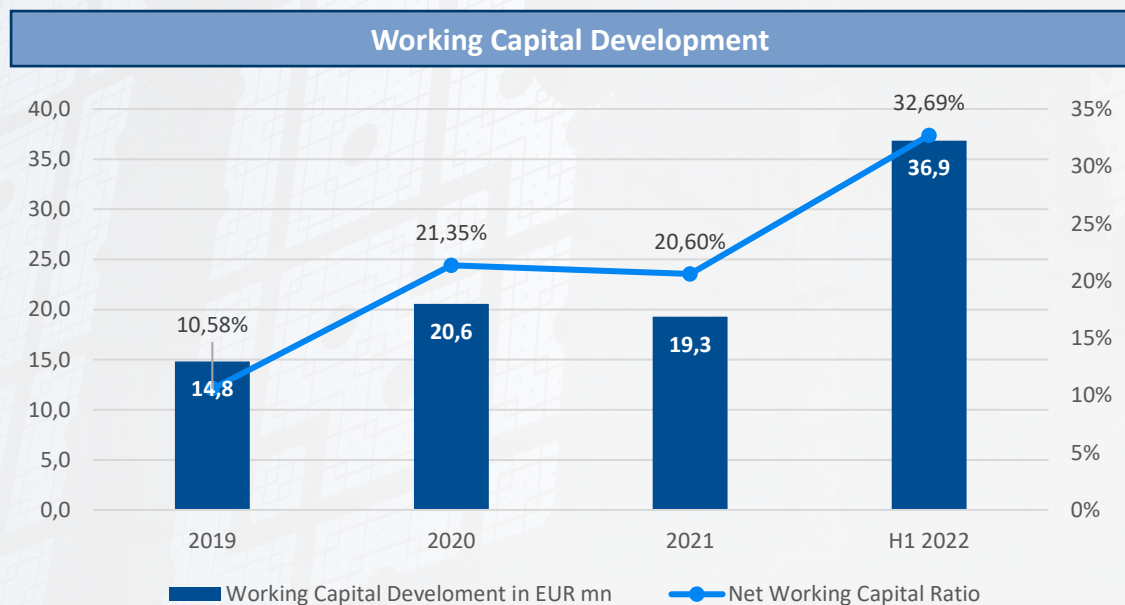
21 CN Deliveries included in H122 sales.

EBIT driven by volume



WORKING CAPITAL AND STOCK TO ASSURE DELIVERIES

IMPROVEMENT OF STOCK AND NWC RATIO FOR FY 2022



Working Capital 2021/22 strongly influenced by Business Unit Solar (China) and conscious addition of stock to ensure deliveries to customers.

Working Capital FY 2022 expected to decrease significantly vs. H1 due to deliveries and operational improvements.



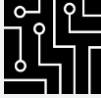











Deliveries for major Solar orders starting in Q2 2022 increased trade receivables for H1 2022. Last cash payments expected Q2/23.

Down payments mainly driven by Solar orders.


RESILIENCE AND BUSINESS TRENDS




LPKF IS PREPARED FOR A RECESSION SCENARIO, CURRENT TRENDS STILL POSITIVE

							
	Development	ARRALYZE	Electronics	LIDE	Welding	Solar	LTP
Effect of Business Cycle	some	independent	some	not directly	partially	independent	some
Current trend							


Operations & Cost




Material Supplies
Stable / slightly improving




Logistics
Currently OK



Energy Dependency & Cost
No process energy
Gas price still fixed for 23



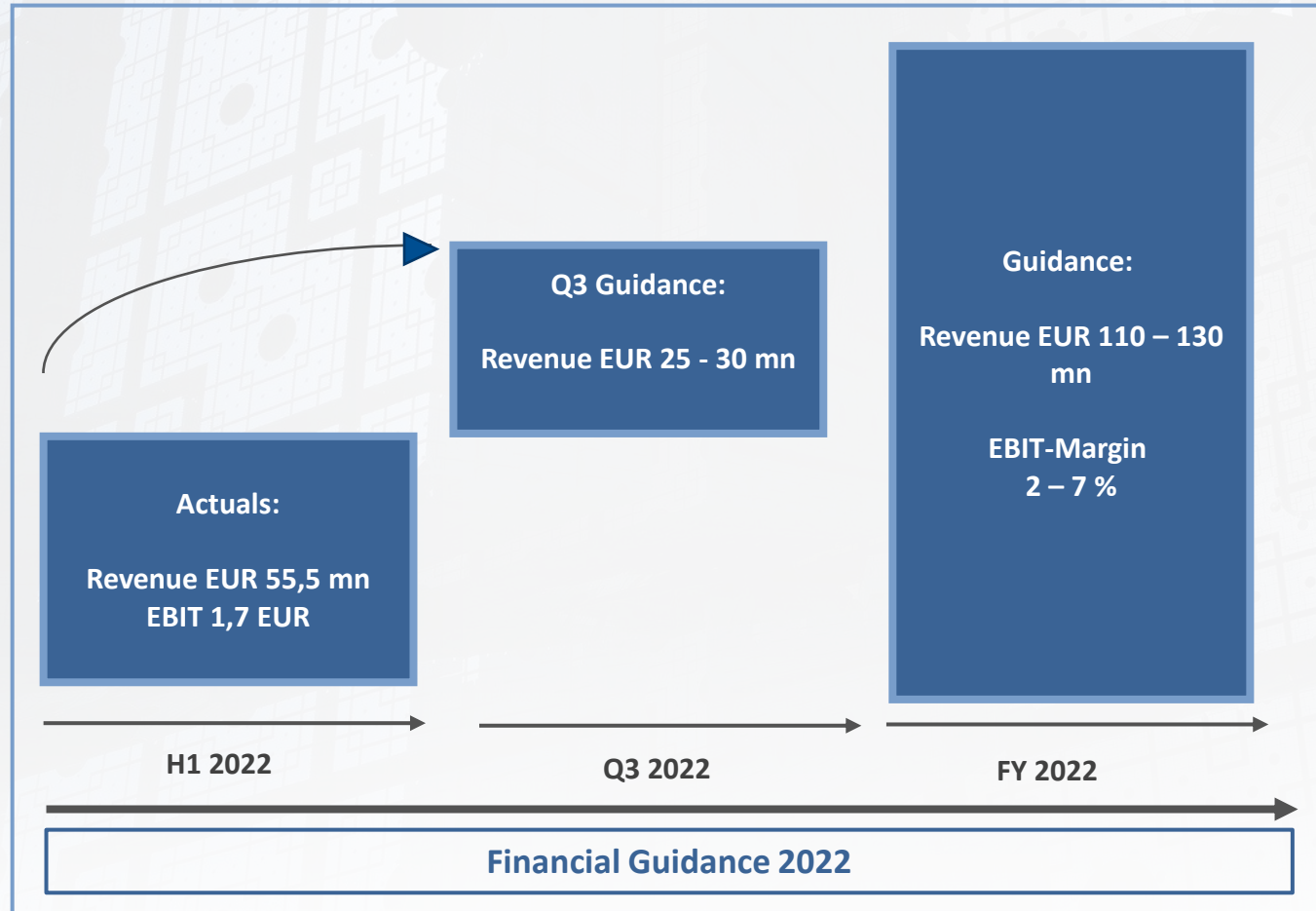
Employee Turnover
slightly increasing,
managed



Working Capital
decreasing inventory and
DWC

2022 GUIDANCE AND MID-TERM ASPIRATION

GUIDANCE 2022 CONFIRMED



Core Business
Medium to high single-digit growth for core business

New Technologies
New technologies like LIDE and ARRALYZE can contribute low triple-digit millions in revenue

EBIT Margin
EBIT margin to reach attractive double-digit level

Mid-Term Aspiration

INVESTMENT HIGHLIGHTS

WHY INVEST IN LPKF?





»» THANK YOU AND Q&A SESSION

WHERE YOU CAN MEET US

UPCOMING EVENTS AND RELEASES



Reporting Dates

October 27, 2022	9-Month Financial Report 2022
March 23, 2023	Annual Financial Report 2022
April 27, 2023	3-Month Financial Report 2023
July 27, 2023	Half-yearly Financial Report 2023
October 26, 2023	9-Month Financial Report 2023

Annual General Meeting

May 17, 2023	Annual General Meeting
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Conferences & Events

October 12, 2022	Virtual Roundtable Alster Research
November 29, 2022	Deutsches Eigenkapitalforum 2022 in Frankfurt
December 6, 2022	CIC Market Solutions Forum in Paris

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» CLOSING – THANK YOU