



» GERMAN EQUITY FORUM – 10N1

LPKF LASER & ELECTRONICS AG | 23 NOVEMBER 2021

CHRISTIAN WITT - CFO

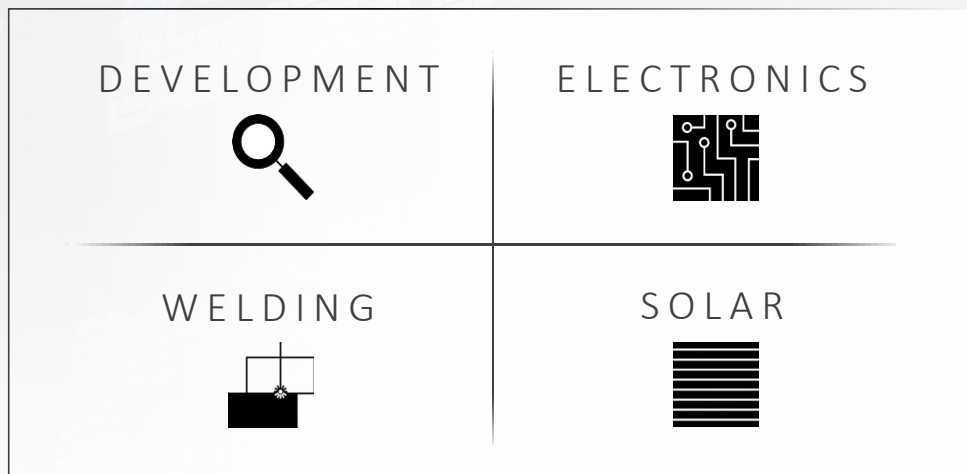
» LASER SPECIALIST

Leading supplier of laser-based precision manufacturing solutions

45 years of experience plus strong innovation pipeline

Enabler of miniaturization and advanced electronic manufacturing

Investing around **10% of revenue in R&D**



» GLOBAL PLAYER

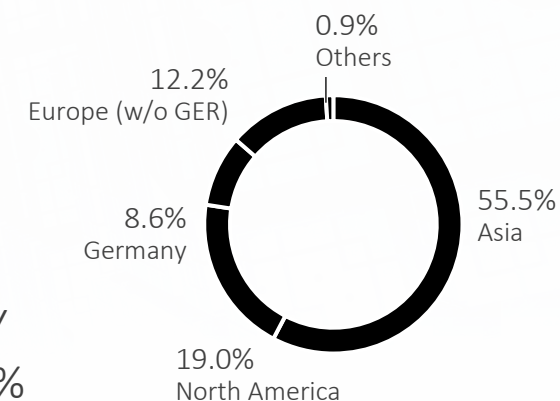
Selling in more than 60 countries;
Export share of approx. 90 %

Approx. 690 employees world-wide

Largest market: **Asia**

Engineering and technological know-how based in **Europe**

2020
REVENUE BY
REGION IN %



SEGMENTS AND MAIN CUSTOMER SEGMENTS

DRIVING GROWTH ACROSS KEY HIGH-TECH INDUSTRIES

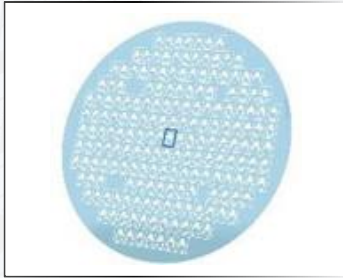


RESEARCH & DEVELOPMENT



Universities
Schools
Design houses
Manufacturers
Governments

SEMICONDUCTOR



IDMs
Fabless
Foundries
OSATs

CONSUMER ELECTRONICS



OEMs
PCB manufacturers
PCB assemblers
Integrated manufacturers

MEDICAL



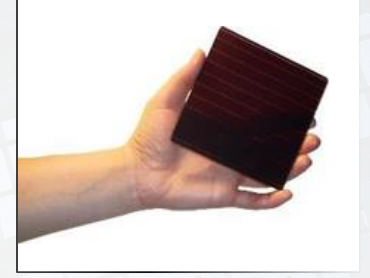
Suppliers of microfluidic and other high end medical devices

AUTOMOTIVE



Tier 1 and Tier 2 Automotive suppliers
OEMs

SOLAR



Thin film solar module manufacturers

DEVELOPMENT

ELECTRONICS

SOLAR

WELDING



MINIATURIZATION

- Devices become smaller, more capable and more efficient
- Cost and size per functionality continues to drop

CLEAN MANUFACTURING

- Quality requirements of end customers, as well as environmental requirements, call for clean manufacturing technologies

DIGITALIZATION

- Consumer demand for increasing functionality drives up electronics volumes
- New products, enabled by electronics, are adopted rapidly

DESIGN FREEDOM

- Drive towards user-focused design and intuitive usability
- Design becomes decisive differentiator across segments

» STRATEGIC OUTLOOK

STRONG FOCUS ON CUSTOMERS AND TECHNOLOGY



» CUSTOMERS

- LPKF established as key technology partner for several large customers (e.g., semicon, consumer electronics, medical, automotive)
- Glass Foundry services built out as differentiator
- LPKF performance has accomplished preferred supplier status across business areas.

» TECHNOLOGY

- LIDE established as standard process for structuring thin glass across industries
- Strong pipeline of new technologies (iterative and/or transformative) for commercialization
- LPKF remains technology leader in each of its current business areas (today's BUs)

» PEOPLE

- LPKF has achieved broad visibility for technology and business talent across tech space
- LPKF attracts top talent from a global and diverse talent pool

» LONG TERM
SUSTAINABLE
GROWTH IN
DIFFERENTIATED
TECHNOLOGICAL
AREAS



KEY TECHNOLOGIES

LIDE

ARRALYZE

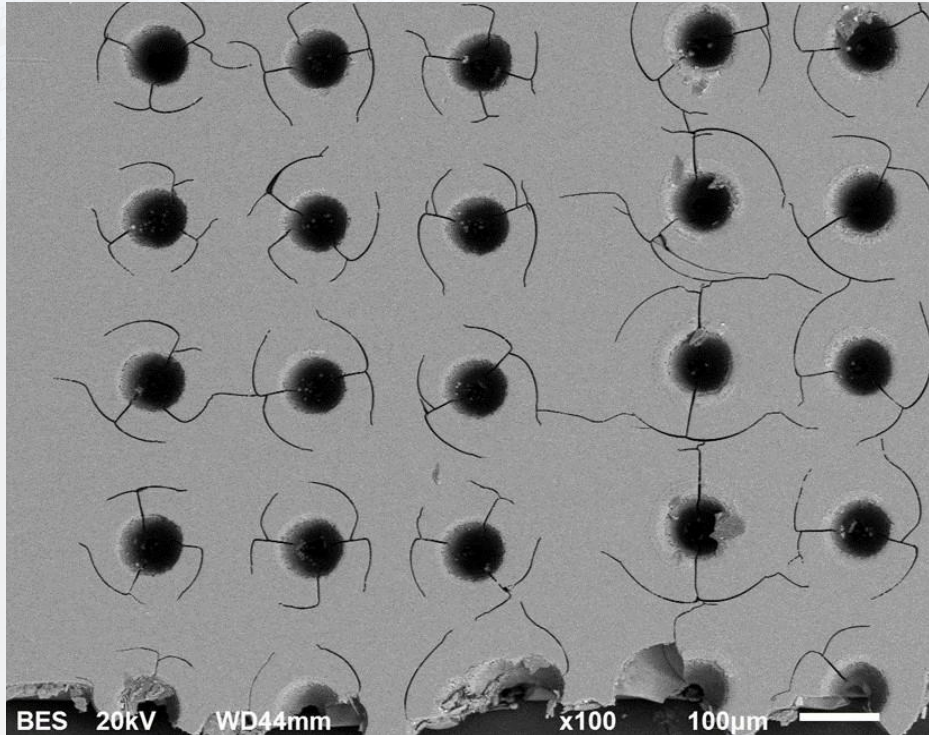
ELECTRONICS

WELDING

SOLAR

» GLASS PROCESSING IS A GREAT CHALLENGE

THE PROCESSABILITY CURRENTLY LIMITS ITS APPLICATION POSSIBILITIES



Standard laser drilled holes with surface defects
(revealed by an etch dip)

» COMMON PROCESSES FOR GLASS PROCESSING

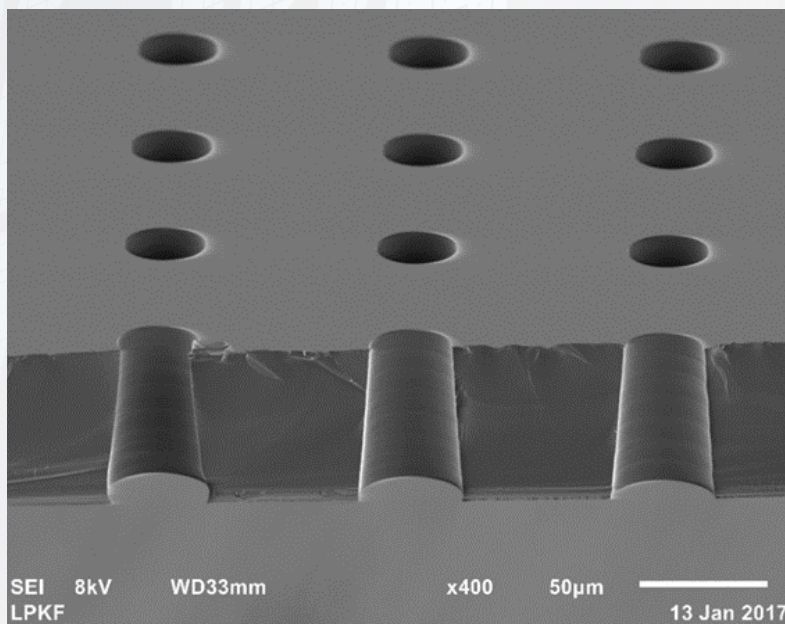
- Masked Isotropic Etching
- Milling
- Water Jet Cutting
- Direct Laser Ablation
- Scribe and Break

» COMMON DRAWBACKS

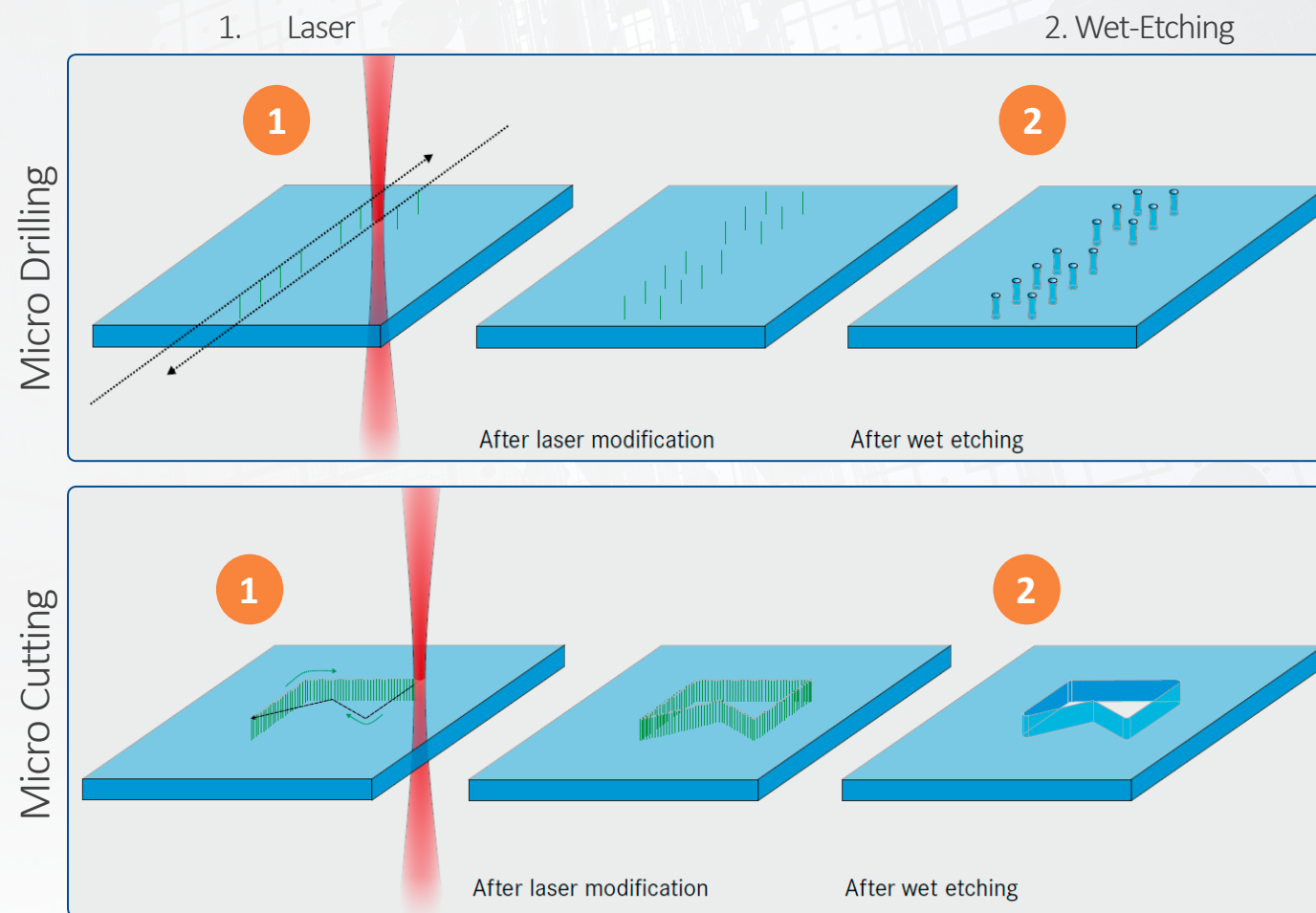
- (Subsurface) Microcracks
- Induced stress
- Low aspect-ratio
- Debris
- Inaccuracy
- Cost

LIDE ENABLES UNIQUE GLASS PROCESSING SOLUTIONS

PATENTED LPKF PROCESS



Standard laser drilled holes with surface defects
(revealed by an etch dip)



LIDE COMMERCIALIZATION STRATEGY

WE ADAPT FLEXIBLY TO DIFFERENT CUSTOMER SEGMENTS AND APPLICATIONS

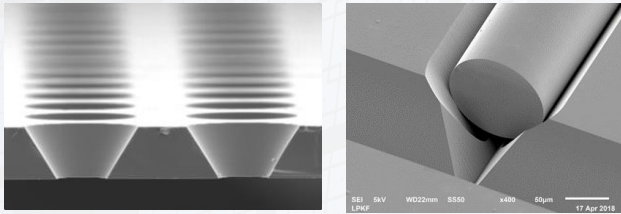


Timeline

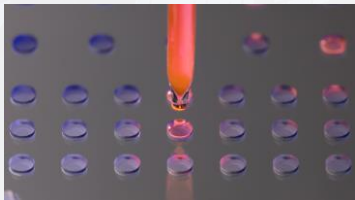


OEM Business

for high volume and highly integrated processing



Manufacturing Service



LIDE Based Solutions

Sample Applications

- Semiconductor
- Display
- Inkjet
- Wafer Level Optics
- Arralyze

KEY ADVANTAGES IN WAFER LEVEL PACKAGING



Standard glass capping wafer

Pocket made by masked isotropic etching

- Low aspect-ratio
- Complex process
- Low density



LIDE glass capping wafer

1

Pocket made by LIDE

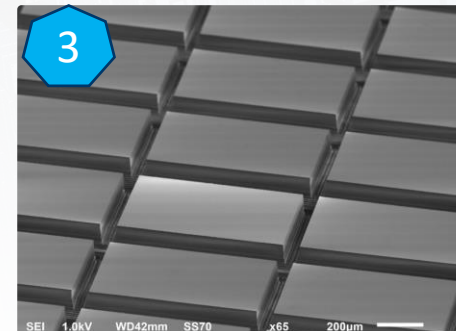
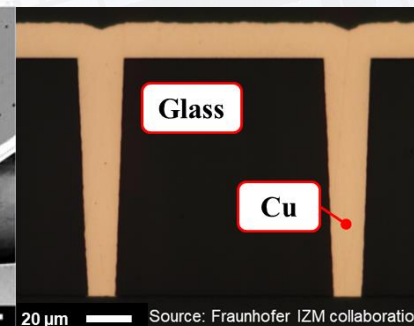
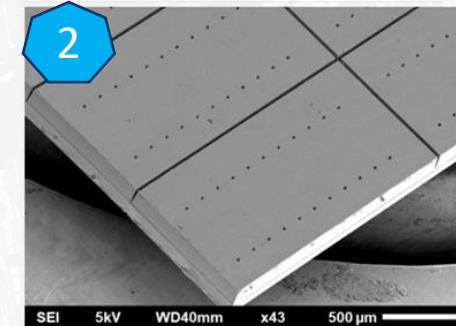
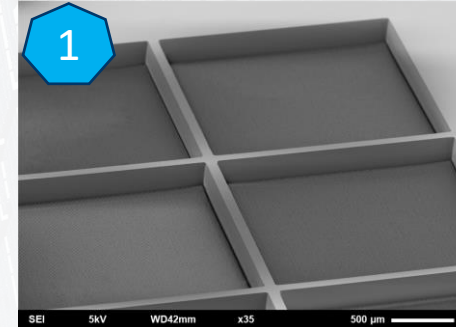
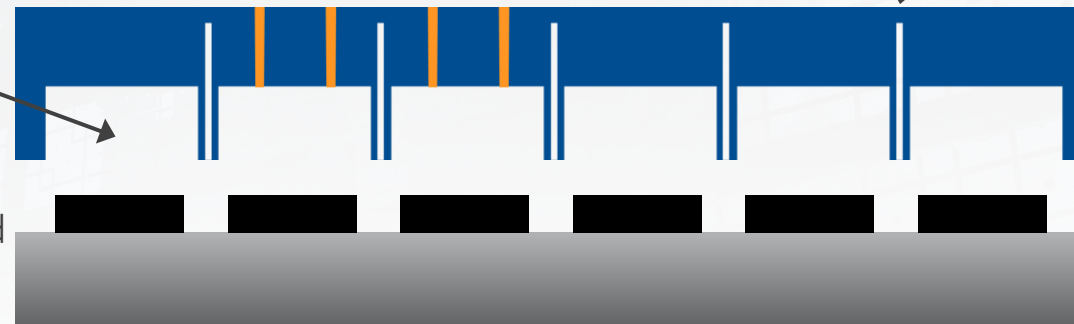
- High aspect-ratio
- Vertical sidewalls
- High density and yield
- No defects
- Low cost

2

Through Glass Vias

3

Dicing Before Grinding

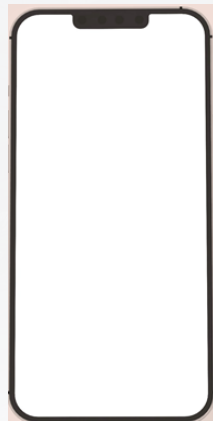
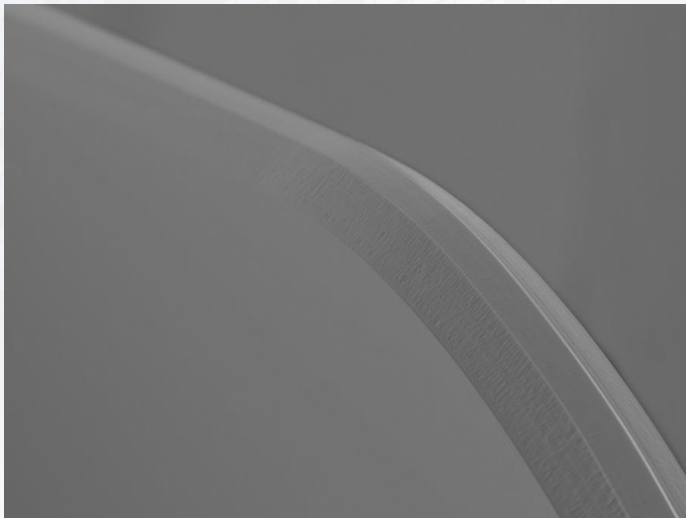


» OUTLINE CUT FOR RIGID GLASS DISPLAYS OFFERS SUPERIOR DESIGN OPTIONS AND BREAK RESISTANCE

DIRECT CHAMFER CUT (DCC)

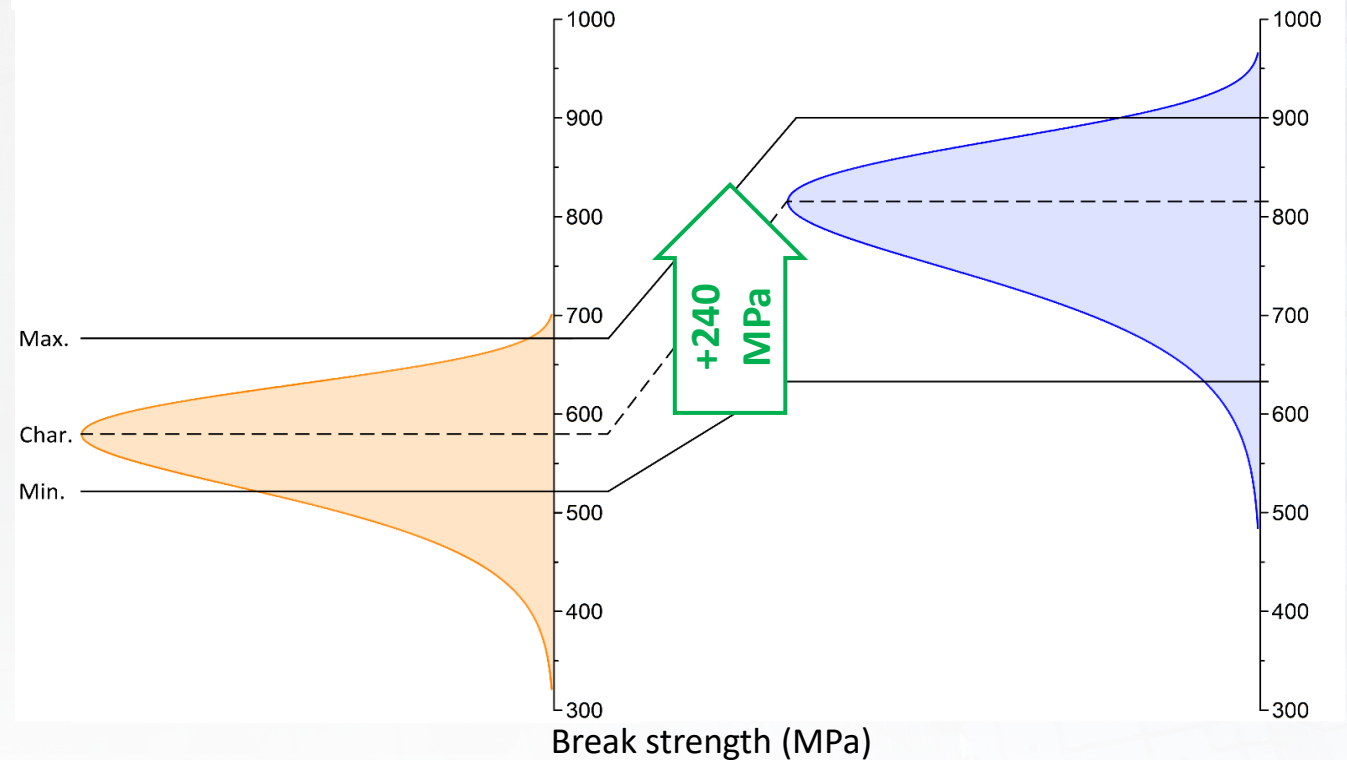


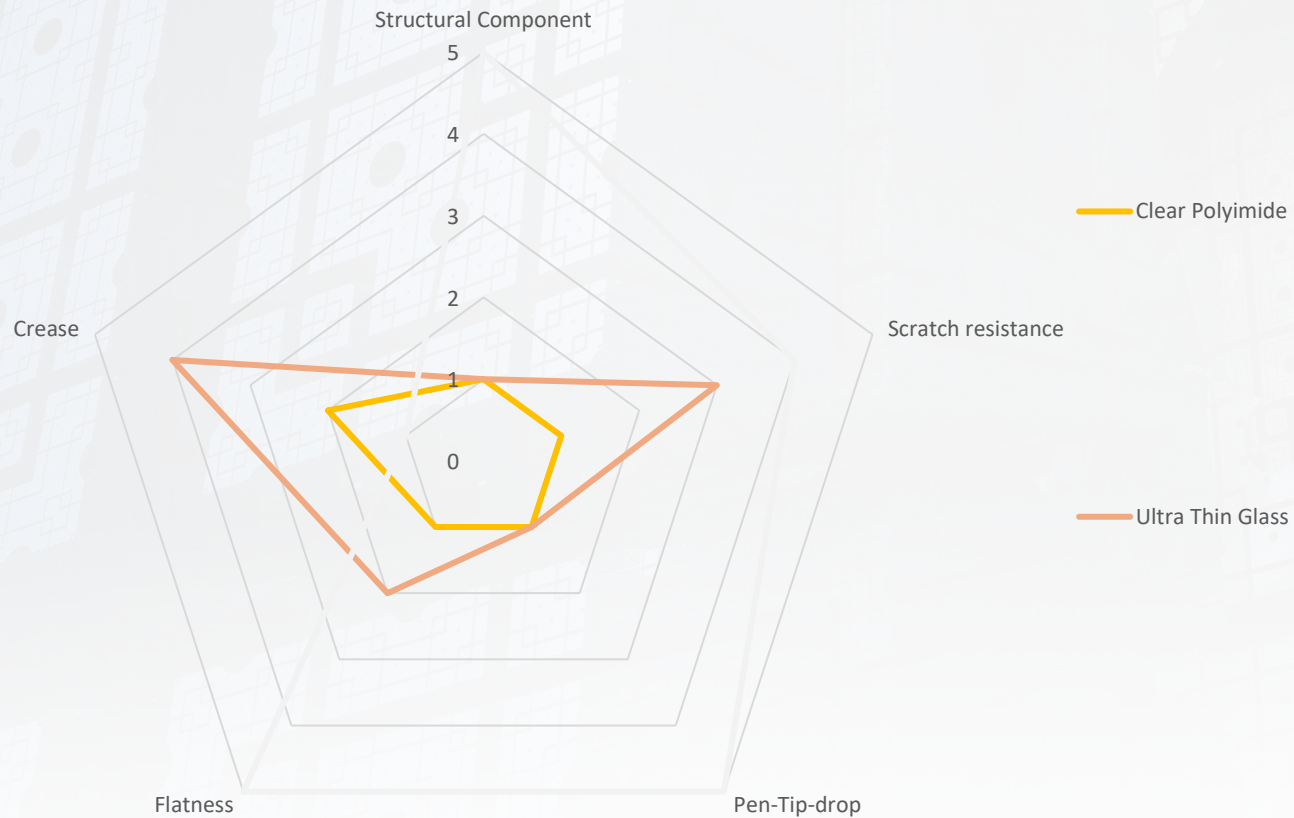
- » LOWER COST DUE TO SHORTER PROCESS FLOW
- » HIGHER DROP RESISTANCE DUE TO ABSENCE OF SUB-SURFACE DAMAGES
- » DESIGN FREEDOM – VARIOUS PROFILE SHAPES

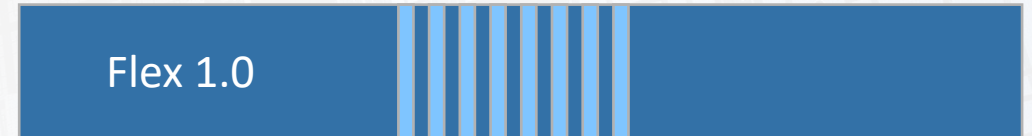
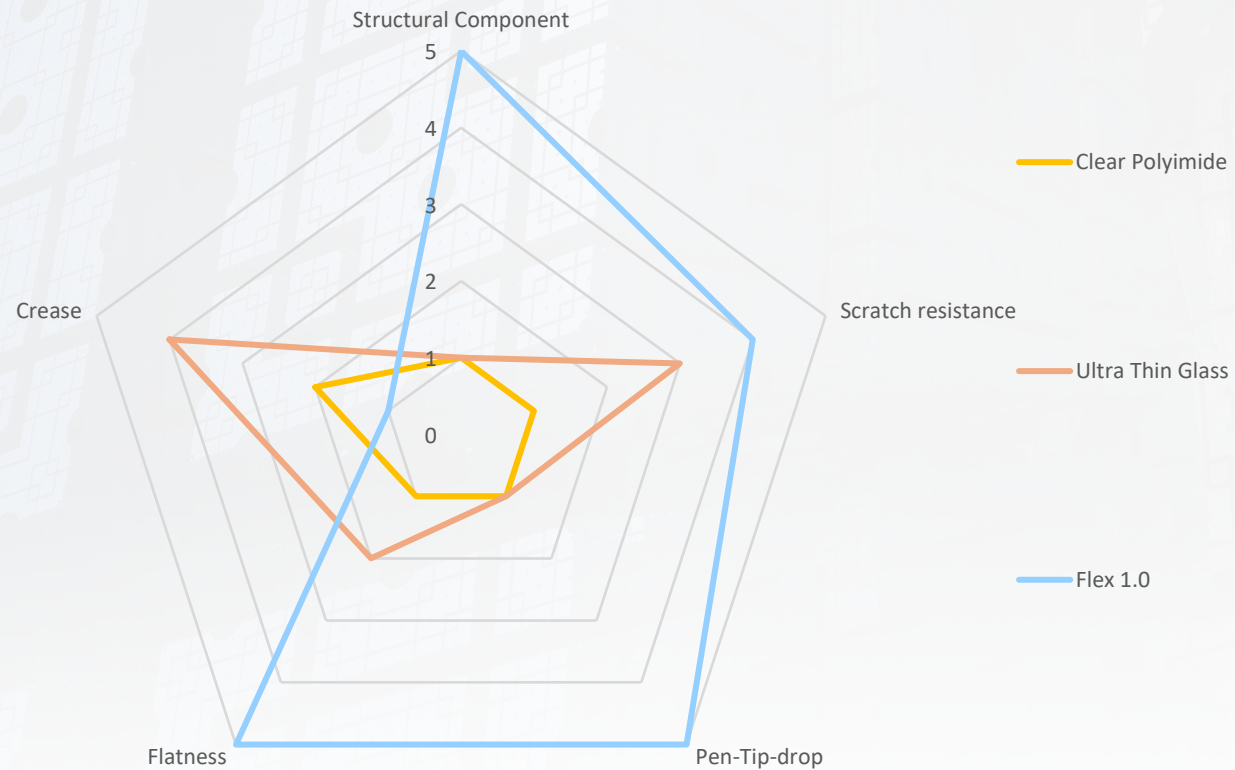


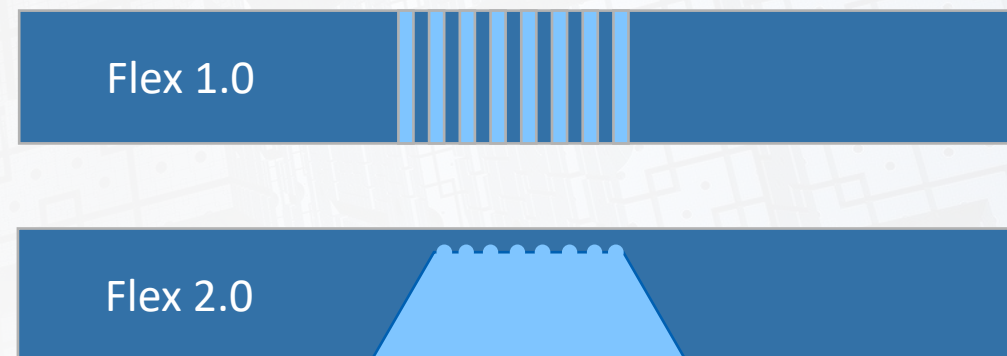
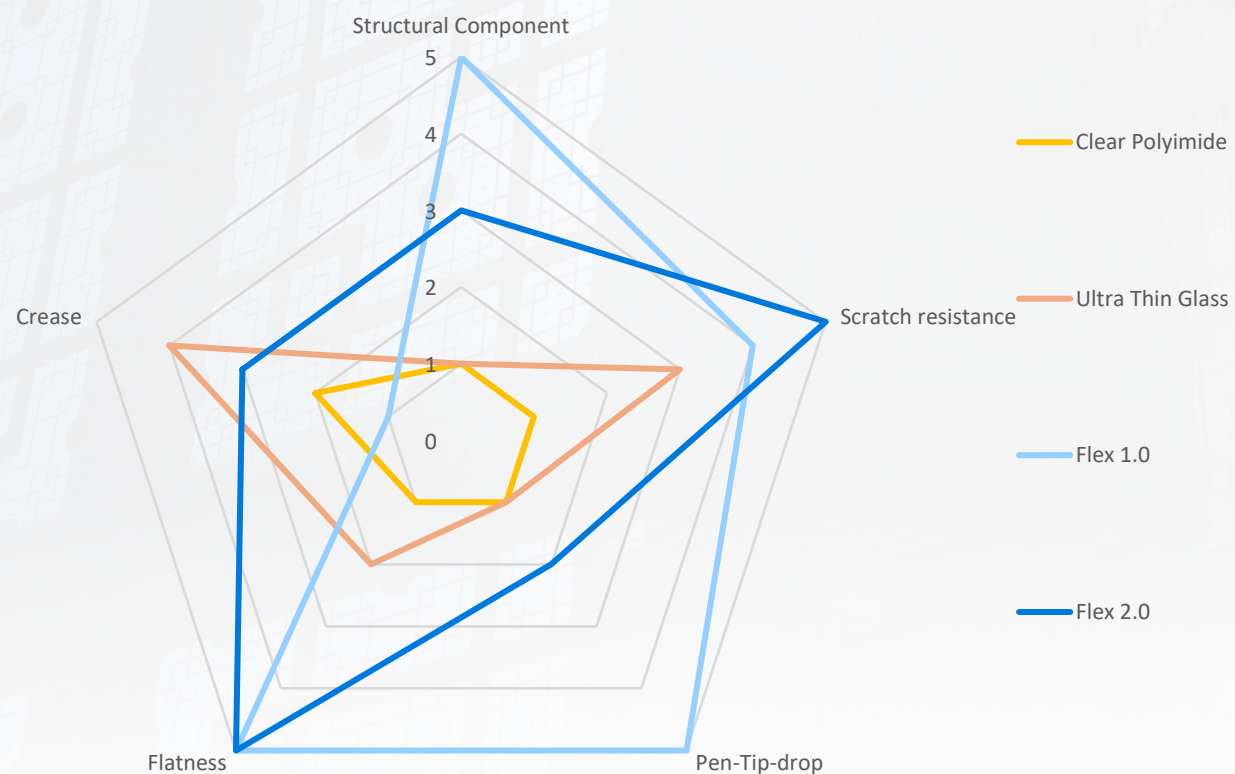
Mechanical process

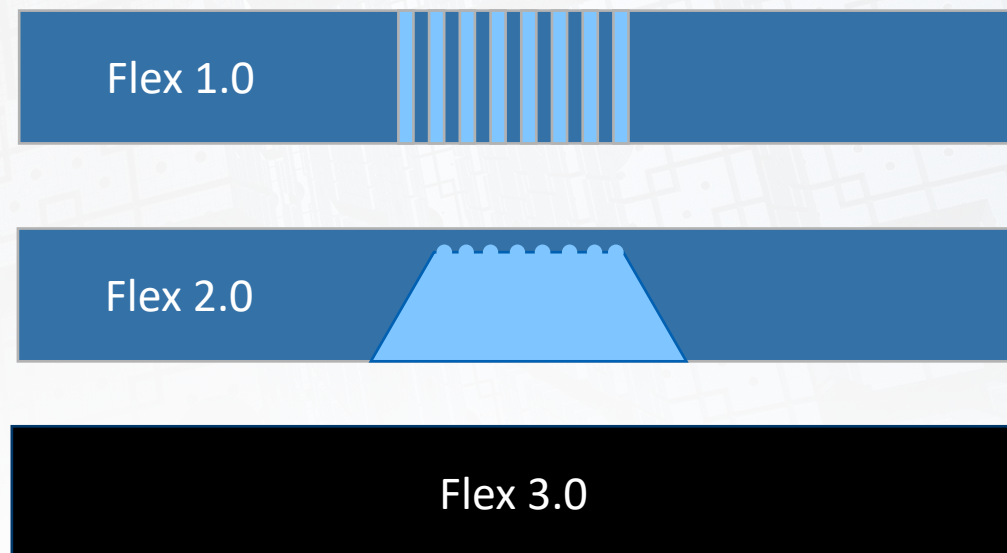
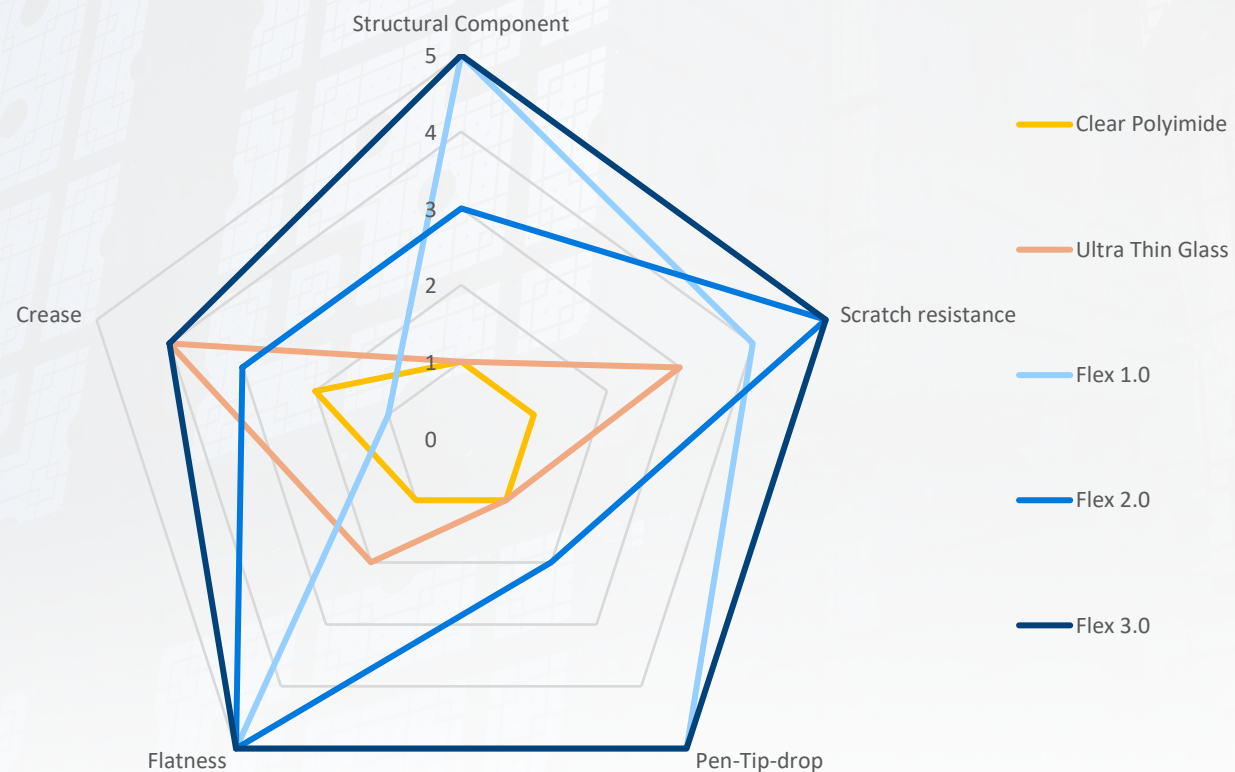
LIDE Direct Chamfer Cut









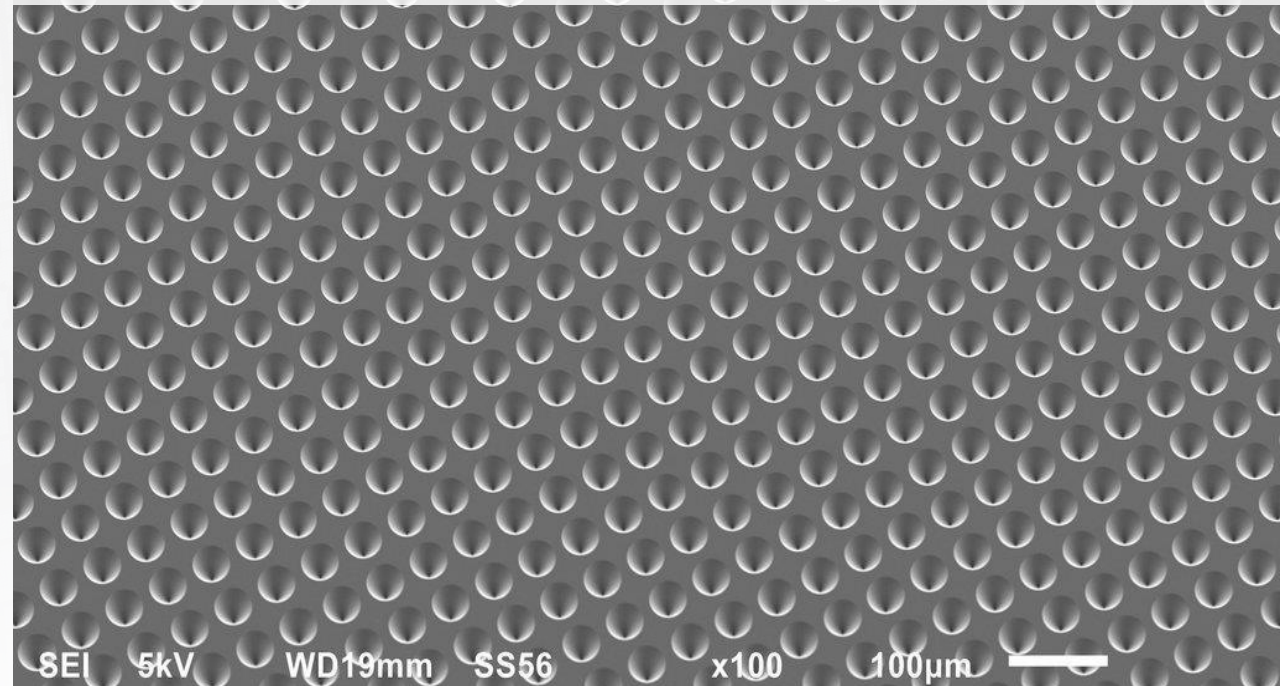


» MICROFLUIDIC APPLICATIONS

PICO WELLS APPLICATION – SINGLE CELL OR DNA ANALYSIS (“OMICS”)



» WELL SIZE: 5 - 200 micrometers
WELL DISTANCE: 1 - 100 micrometers
DENSITY: 10 - 1000x higher



» ARRALYZE WORKSTATION LAUNCH IN 2022

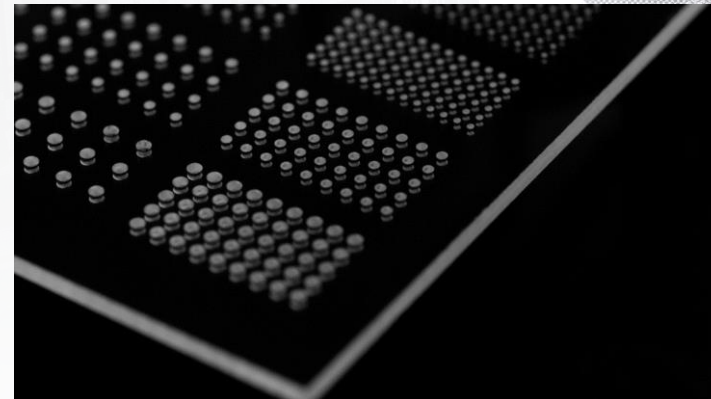


» FACTS & FIGURES

- Digital Cell Biology Platform for Discovery, Development and Delivering of Cell-Based Products
- Enables screening of huge cell populations
- Miniaturization offers the potential for massive cost reduction
- Nanowells allow to screen huge populations on small footprint and enable faster screening of wells in 2D and 3D
- Based on existing technology (Segment Development and LIDE)

Applications: Cell Line Development, Monoclonal Antibodies, Immunotherapy, Synthetic Biology

Current Status: Launch in Q1 2022, sales H2 2022





affordable
improvements in
biology

Dramatic drop in costs, particularly for DNA sequencing, over the past two decades revolutionized opportunities in biomedical research



available
computing
power

Computing power becomes a commodity and sets the ground for sophisticated data-driven high-throughput experiments



enabling
manufacturing
technology

New technologies allow to handle individual cells economically with high throughput. LIDE technology allows for massive minitaturization in glass.

Macro trends in pharma and biotech demonstrate the need for platforms that enable rapid and data-driven innovation.

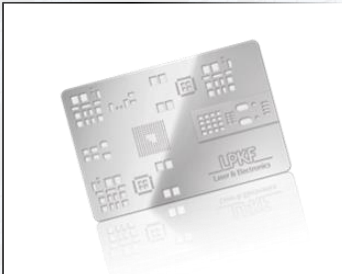
The increasing demand for e.g. monoclonal antibodies, novel cancer therapeutics and the need for more cost-effective as well as faster time-to-market developments for cell-based products cannot be met with conventional development and screening technologies.

SOLUTIONS FOR MASS PRODUCTION

OUR MACHINES ARE READY FOR 24/7 OPERATION IN VARIOUS FIELDS



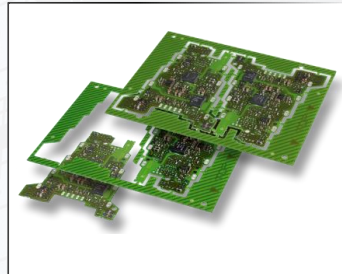
SMT STENCIL TECHNOLOGY



- Attractive niche market
- Strong market position
- Long-term customers
- Stencil shops



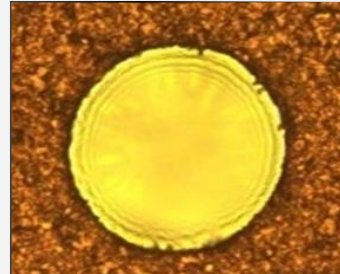
LASER DEPANELING



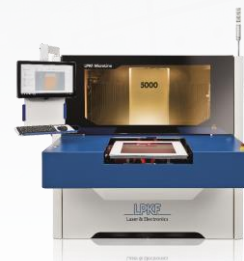
- Largest business
- Consumer electronics
- Part of SMT Lines
- price/performance



MULTI PURPOSE



- Flexible platform to realize various customer applications



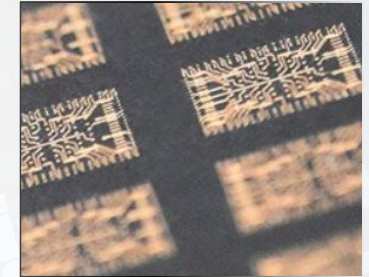
LDS TECHNOLOGY



- Boom-Bust-Light Recovery
- Antenna
- Replacement business
- 5G base
- Not a key growth pillar



AMP TECHNOLOGY



- New disruptive technology in IC Packaging
- Gaining traction

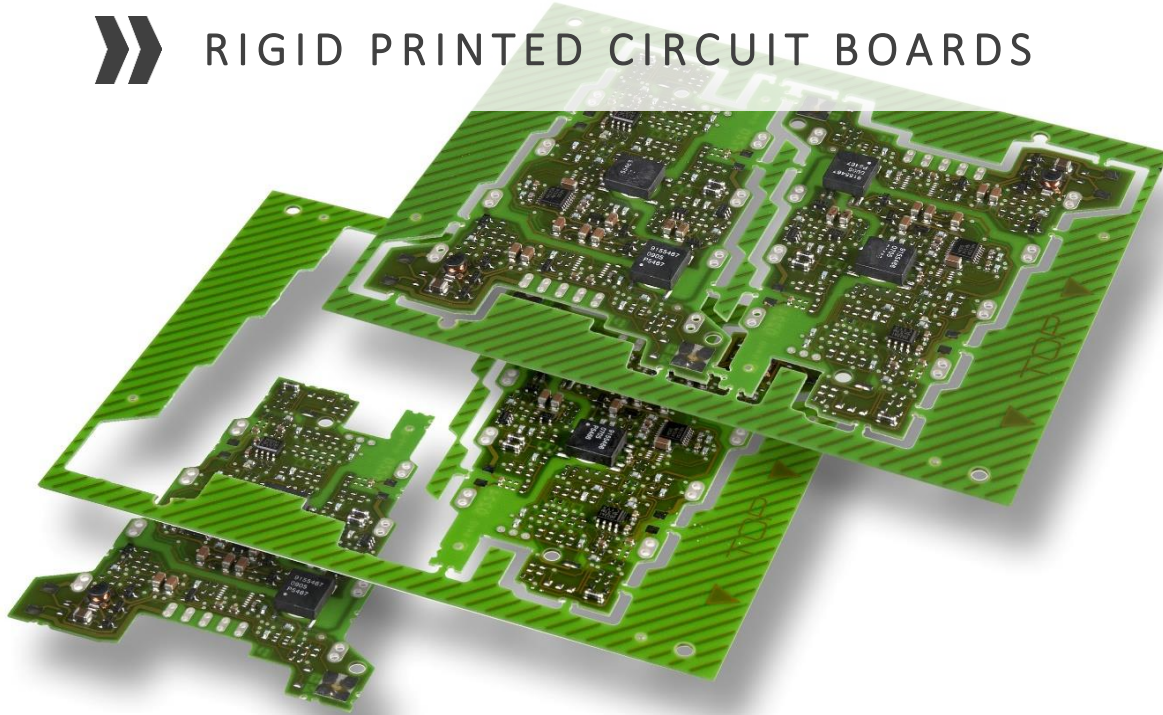


» DEPANELING OF ASSEMBLED PCBS

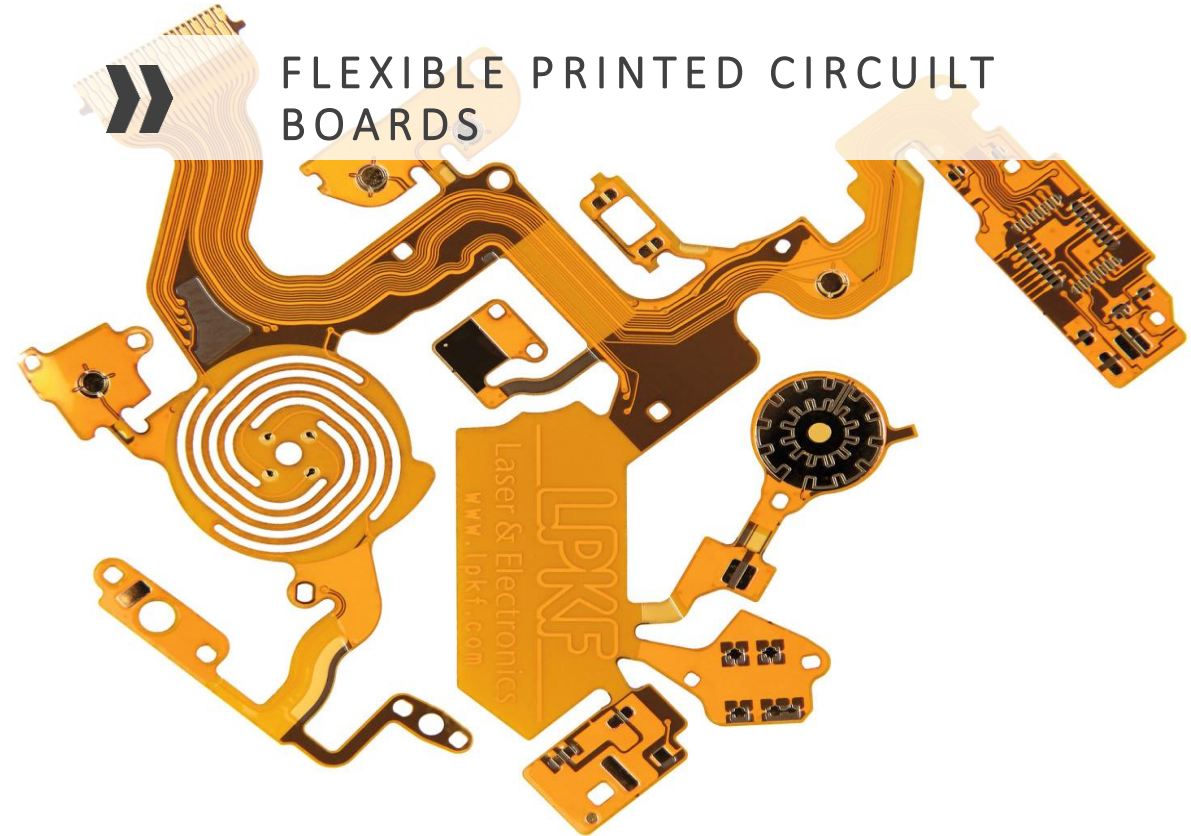
HIGHEST QUALITY AND TECHNICAL PURITY AT LOWER COSTS



» RIGID PRINTED CIRCUIT BOARDS



» FLEXIBLE PRINTED CIRCUIT BOARDS



» LASER DEPANELING REPLACES MECHANICAL SOLUTIONS

OUTSTANDING SOLUTIONS FOR PCB PROCESSING



» CONVENTIONAL METHODS

Mechanical Milling



Die Punching



Pizza Cutter

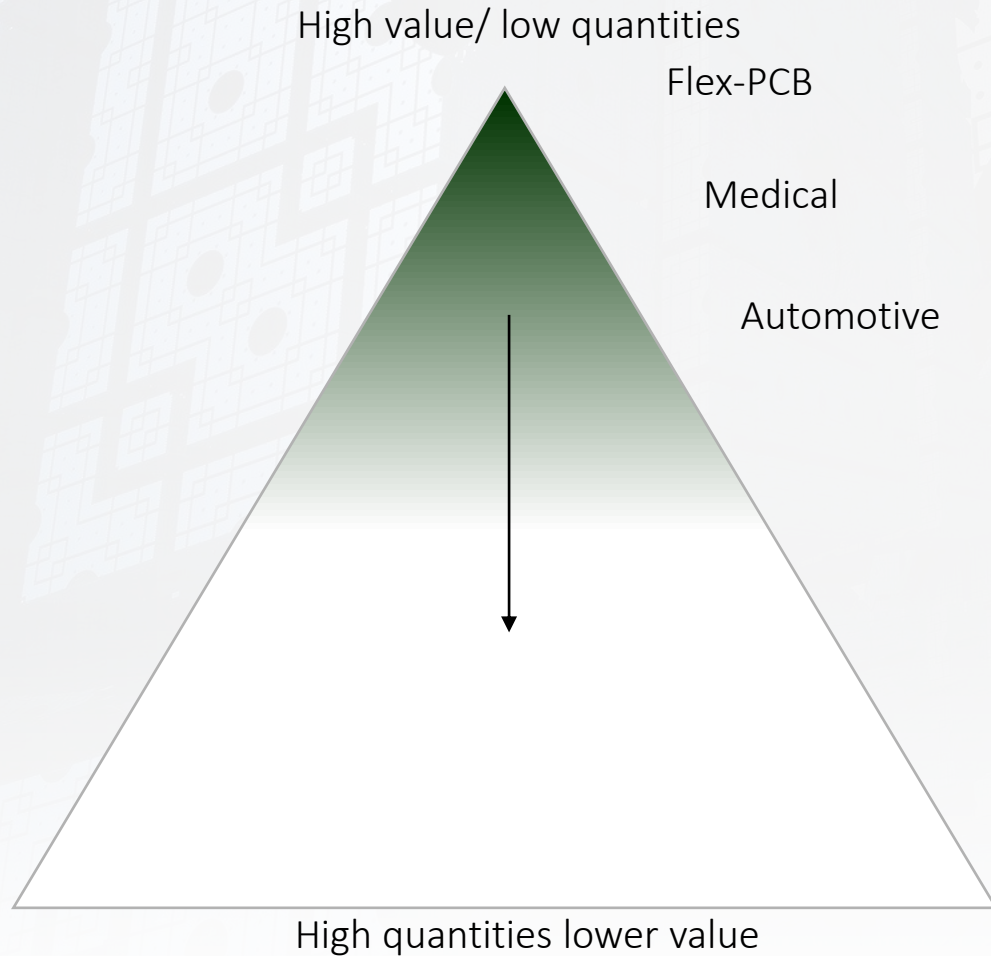


» LASER DEPANELING



CONVERTING AND CAPTURING MARKETS

LASER DEPANELING REPLACES MECHANICAL SOLUTIONS



» EFFECTIVE CUTTING COSTS

- The quotient of costs to effective cutting speed [€/ mm/s]
- Cost reduction of a factor of 10 over the last decade
- Mainly due to increasingly powerful lasers with simultaneously decreasing prices of this main component
- Advanced processing strategies and software features enable the use of the high available power



PERMANENT IMPROVEMENT OF PRICE PERFORMANCE

COST REDUCTION OF FACTOR 10



» EFFECTIVE CUTTING COSTS

- The quotient of costs to effective cutting speed [€/ mm/s]
- Cost reduction of a factor of 10 over the last decade
- Mainly due to increasingly powerful lasers with simultaneously decreasing prices of this main component
- Advanced processing strategies and advanced software features allow the high power available to be used
- Payback time: 1 – 4 years

» TENSOR BOOSTS LPKF PRICE PERFORMANCE RATIO

LIDE APPLICATION OVERCOMES LIMITATIONS IN LASER BEAM STEERING

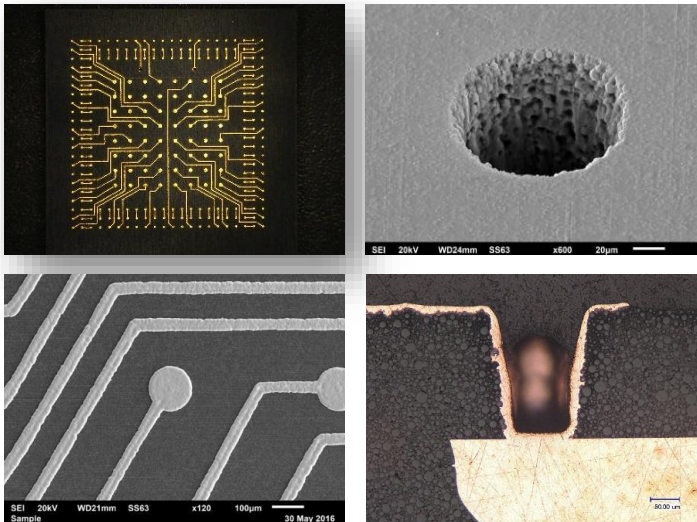


» NEW STANDARDS IN LASER MICRO MATERIAL PROCESSING

- Tensor is a patented ultrafast beam guidance technology
 - Transmission of more than 99 % enhances efficiency of available energy
 - Reduces total cost of ownership by up to 40 %
 - Reduction of cycle times by up to 70%
 - based on LIDE technology
- Practice proof: The new LPKF CuttingMaster 2240 is four times faster than its predecessor
 - Ideal for cutting thicker PCB material: higher quality and productivity

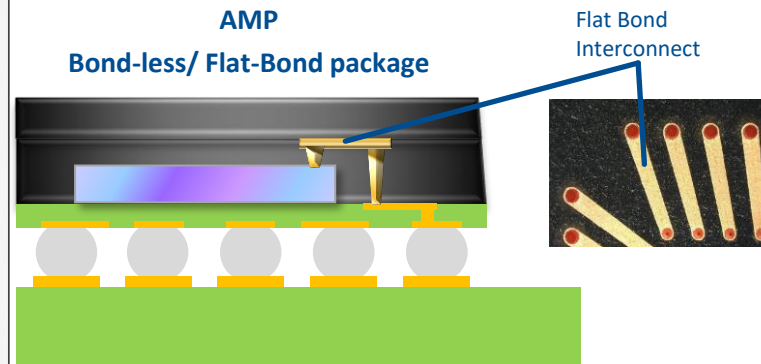
WHY?

Improve IC package performance by additive copper formation on the encapsulating mold compound.

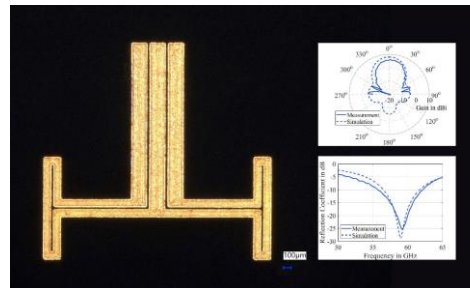


WHAT?

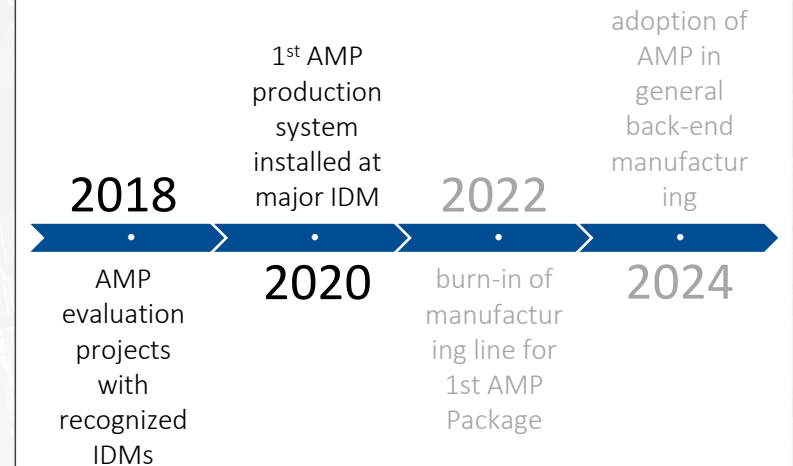
1. Replace copper wire bonds



2. Antennas-on/in-Package (AiP/ AoP)



WHEN?



» MEGATRENDS IN ALL INDUSTRIES LEAD TO FUTURE GROWTH POTENTIAL FOR LPKF

AUTOMOTIVE

» E-Mobility and Autonomous Driving

- Interior / Exterior
 - Dashboards
 - Interior Light (Smart bar)
 - Display
 - Radoms (Logo)
- E-Mobility / Auto
 - Vehicle Batterie pack
 - Thermomanagement
 - Sensors
 - Electronics/Actuators

MEDICAL

» Demographic Development

- 2 μ (Clear joining)
 - Microfluidics / lab. Chips
 - Transparent applications
- Micro Electronics (internal):
 - Hearing devices
 - Pacemaker
- Electronics (external):
 - Blood Glucose Monitoring
 - Emergency care buttons
- Ventilator systems

CONSUMER

» Electrification (IOT), Miniaturization, Recycling





- 2 μ Bottle / Container (Recycling: Same material & Clear materials)
- Consumer & Micro Electronics
 - In-ear headphones
 - electric shaver
- E-Cigarettes / disposable products

OTHERS

» Electrification (IOT), Miniaturization, Recycling

- Solar
- Safety switch
- Furniture industry
- Toy industry
- Packaging
- Fashion /textile

» FOCUS ON UNDERDEVELOPED REGIONS AND INDUSTRIES BY SALES INITIATIVES

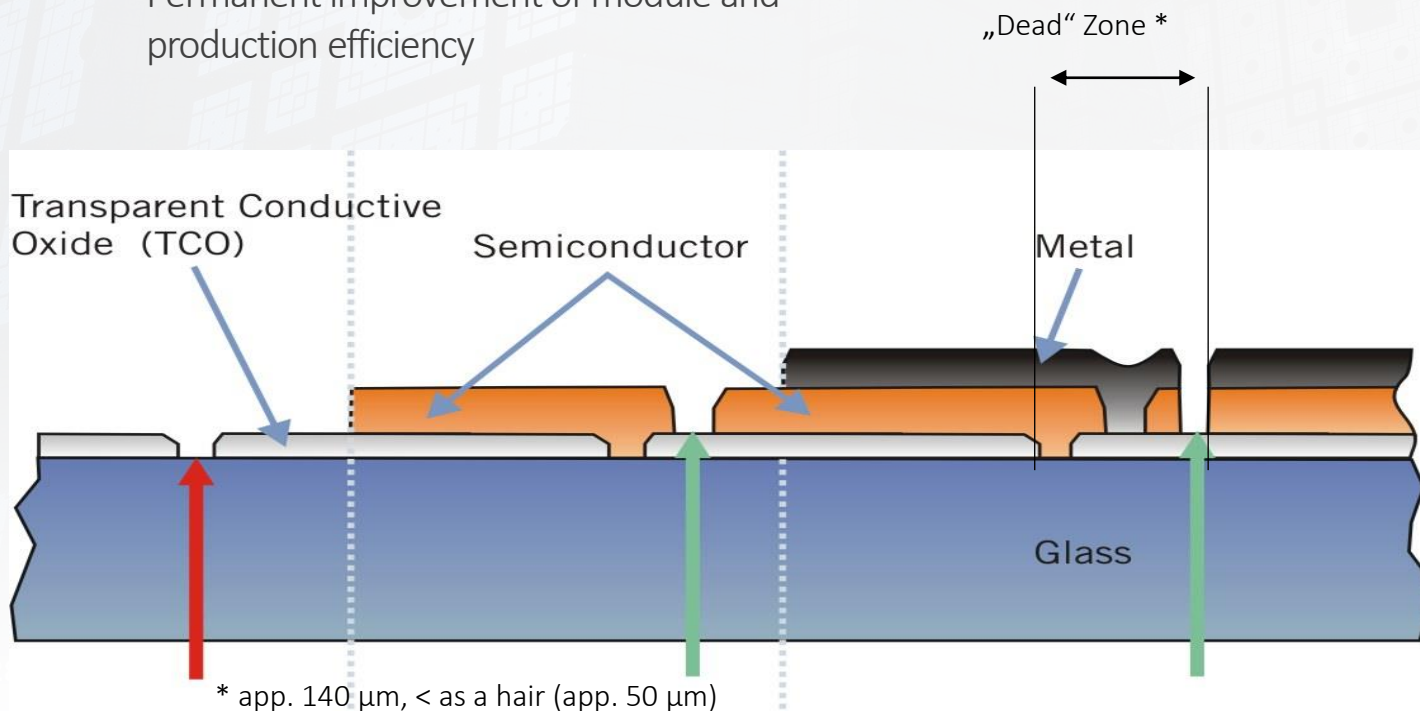
	Europe	Americas	China	Asia (Korea, Japan, ASEAN)
Automotive 	First Battery cell Project with German premium Manufacturer (PW3D8000)		Chinese Radar head Manufacturer (IW6200)	First Sensor project with leading Korean automotive supplier (IW6200)
Medical 	Micro fluidic Medical projects New Customer (PW2600)		Diagnostic system won against Leister (PW2600)	First medical Project with global Medical product company in Singapore (PW4600)
Consumer 	Acquisition project with global Headphone Customer (PW2600)			Acquisition project game software cartridge (PW4600)
Others 	LiquiSampler (IW0500)			

» SOLAR: INCREASING MODULE AND PRODUCTION EFFICIENCY ≡

SERVING ALL RELEVANT THIN FILM CUSTOMERS

» LASER SCRIBING ADVANTAGES

- Structuring of thin-film solar cells
- Our laser systems provide a competitive advantage by making modules more efficient (reduction of “dead zone”)
- Permanent improvement of module and production efficiency

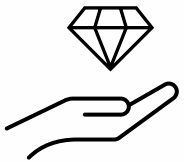


» STRONG BASIS FOR GROWTH

- fully established with western and Chinese key customers
- 2 major orders received in Q3 2021 with volume of approx. 10 million, delivery 2022/2023
- further potential with expansion of green energy



» Our energy-efficient and intelligent solutions **contribute to climate protection** and progress in medicine. They **save resources**, improve safety on the roads, and increase well-being at work and at home.



SUSTAINABLE VALUE CREATION

Our technologies enable better products with less resources

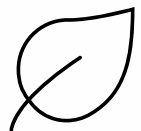


EMPLOYEES

Occupational safety and health protection system

Diversity

Qualification

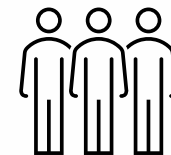


ENVIRONMENT

Reduction of CO₂ emissions, neutral by 2030

100% renewable energy until 2024

Complying with RoHS and REACH



SOCIETY

Compliance and Whistleblower System

UN Global Compact

Code of Conduct

Certifications:

ISO 9001; ISO14001 and ISO 45001 in progress

Ratings:

MSCI: BBB

ISS: C-

» NEW CEO TO JOIN IN JANUARY 2022

DR. KLAUS FIEDLER



"I want to accelerate growth with full commitment and technological vision."



DR. KLAUS FIEDLER, DESIGNATED CEO

- Ph.D in Physics
- broad experience in technology and innovation
- currently Vice President and Head of Corporate Ventures at SCHOTT AG, responsible for the global identification, assessment, and incubation of new business opportunities.
- served in various senior management positions at Knowles Electronic in China, at NXP in Austria and at Philips Research in the USA and in Germany
- strong customer focus and deep understanding of the relevant markets in Asia-Pacific, North America and Europe
- has lived and operated across the world and successfully led cross-functional and multi-cultural teams.



BASED ON 9 MONTHS REPORT 2021

FINANCIALS

KEY GROUP FIGURES

9 MONTHS 2021



in Mio. EUR	9 Months 2021	9 Months 2020	Δ%
Revenue	60.2	75.2	-19.9
EBIT	-5.2	6.8	-176.5
EBIT margin (%)	-8.6	9.1	
Incoming orders	89.6	65.3	37.2
Earnings per Share (EUR)	-0.15	0.20	-175.0
Free Cashflow	-11.3	-13.2	14.4
	As of 09/30/2021	As of 09/30/2020	
Orders on hand	67.7	22.4	202.2
Employees (total number)	733	693	5.8

SALES, PROFIT, AND OUTLOOK

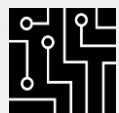
- Lower revenue due to lower volume Solar, main turnover is in Q4
- Lower EBIT due to lower sales volume and additional personnel in R&D / LIDE
- Stronger Order Intake and order book in nearly all areas
- Solar OI Q3 includes ca. 15m for two large orders; Welding strong
- Clear positive outlook

REVENUE AND EBIT BY SEGMENT

AFTER 9 MONTHS



in Mio. EUR	Revenue			EBIT		
	9 Months 2021	9 Months 2020	Δ%	9 Months 2021	9 Months 2020	Δ%
Electronics	20.5	24.0	-14.6%	-2.5	2.6	-196.2
Development	15.0	15.3	-2.0%	0.1	1.2	-91.7
Welding	18.0	13.3	35.3%	0.8	-2.0	140.0
Solar	6.7	22.6	-70.4%	-3.6	5.0	-172.0
Gesamt	60.2	75.2	-19.9%	-5.2	6.8	-176.5



ELECTRONICS

Some sales shifted to Q4, additional personnel for LIDE, good pipeline 22



WELDING

Strong sales and order pipeline with broadened customer and application base



DEVELOPMENT

Still some COVID impact on customers in Q3, good pickup in the last 3 weeks; additional personnel for Arralyze



SOLAR

Shift of revenue of EUR 5m to Q4 as announced, approx. 50% of Q4 deliveries already produced & packed

» FREE CASHFLOW

AS PER 30 SEPTEMBER 2021



in Mio. EUR	9 Months 2021	9 Months 2020
Net cash used in / generated by operating activities	-5.1	-4.9
Net cash used in investing activities	-6.2	-8.2
Free cashflow*	-11.3	-13.2
Net cash position as per 09/30/2021	1.5	8.0

» FREE CASH FLOW

Received down payments, higher inventory

Pulling in inventories (will affect Q4, possibly Q1/2)

Target NWC remains at <10% post “long-COVID”

LIDE foundry investment 2020, lower in 2021

*Free cashflow 6 months 2021: -8,255 kEUR



BASED ON 9 MONTHS REPORT 2021

OUTLOOK

» FOR FY 2021, LPKF ANTICIPATES:

GROUP SALES
110-120 MIO. EUR

EBIT MARGIN
10-13%

» AT THE LOWER END OF THE RANGE

» FOR 2024, LPKF ANTICIPATES:

GROUP SALES
➤ 360 MIO. EUR

EBIT MARGIN
> 25%

This forecast is subject to stable growth in the global economy.

BROAD BASIS FOR PROFITABLE GROWTH

CAGR CORE BUSINESS 15-20%, LIDE WELL DIVERSIFIED



in Mio. EUR

■ Revenue
● EBIT

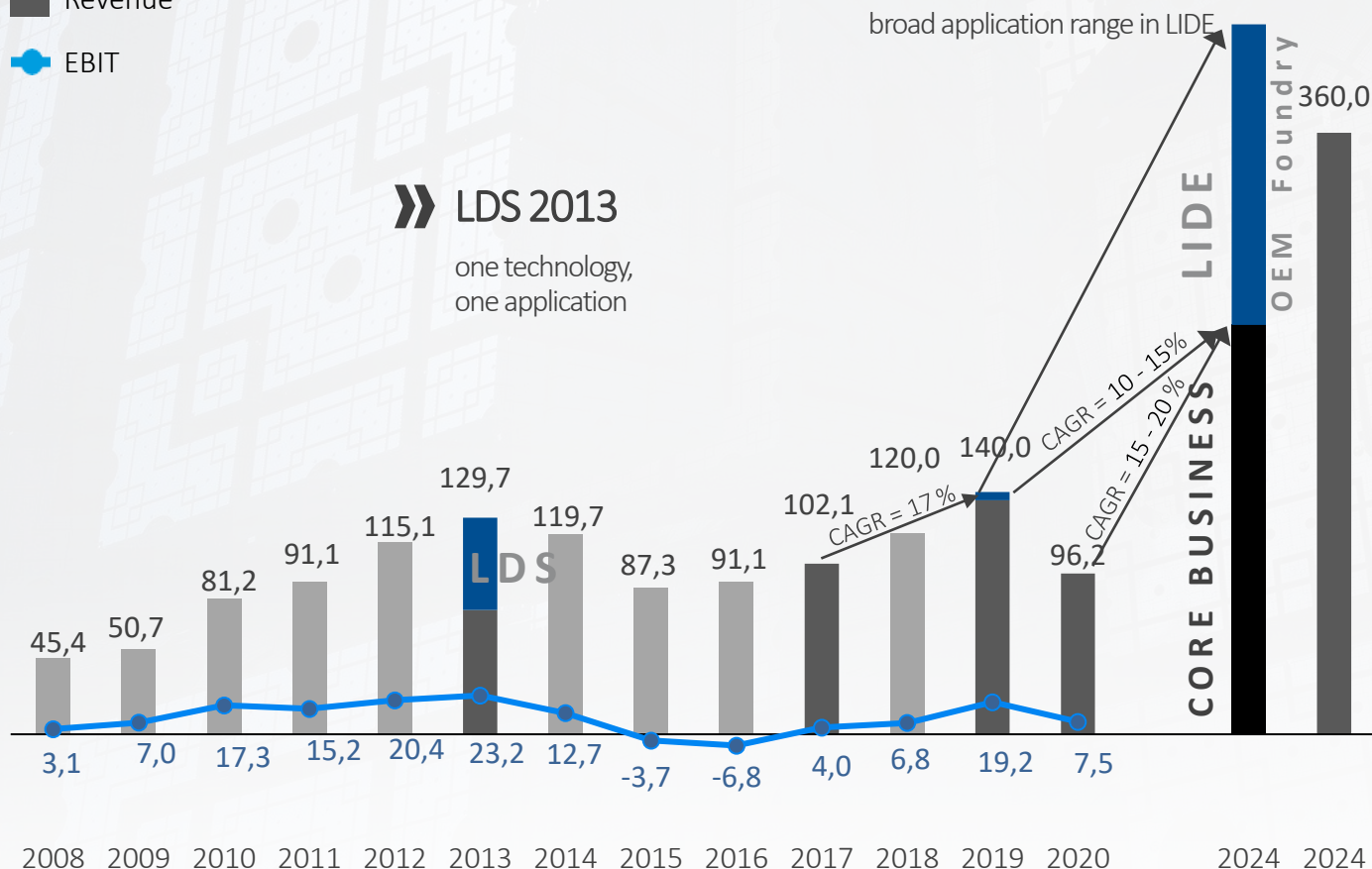
LDS 2013

one technology,
one application

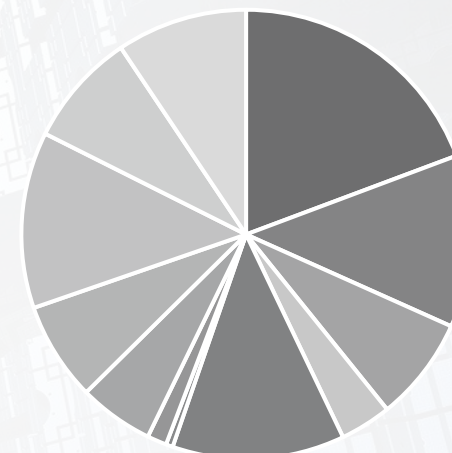
2019-2024

broadening base in core segments

broad application range in LIDE



LIDE in 2024 well diversified



update 09/2020

LIDE ESTIMATE FOR 2024

- most initiatives validated by customer projects
- conservative approach in all areas
- Foundry revenue with significant additional discount (timing)



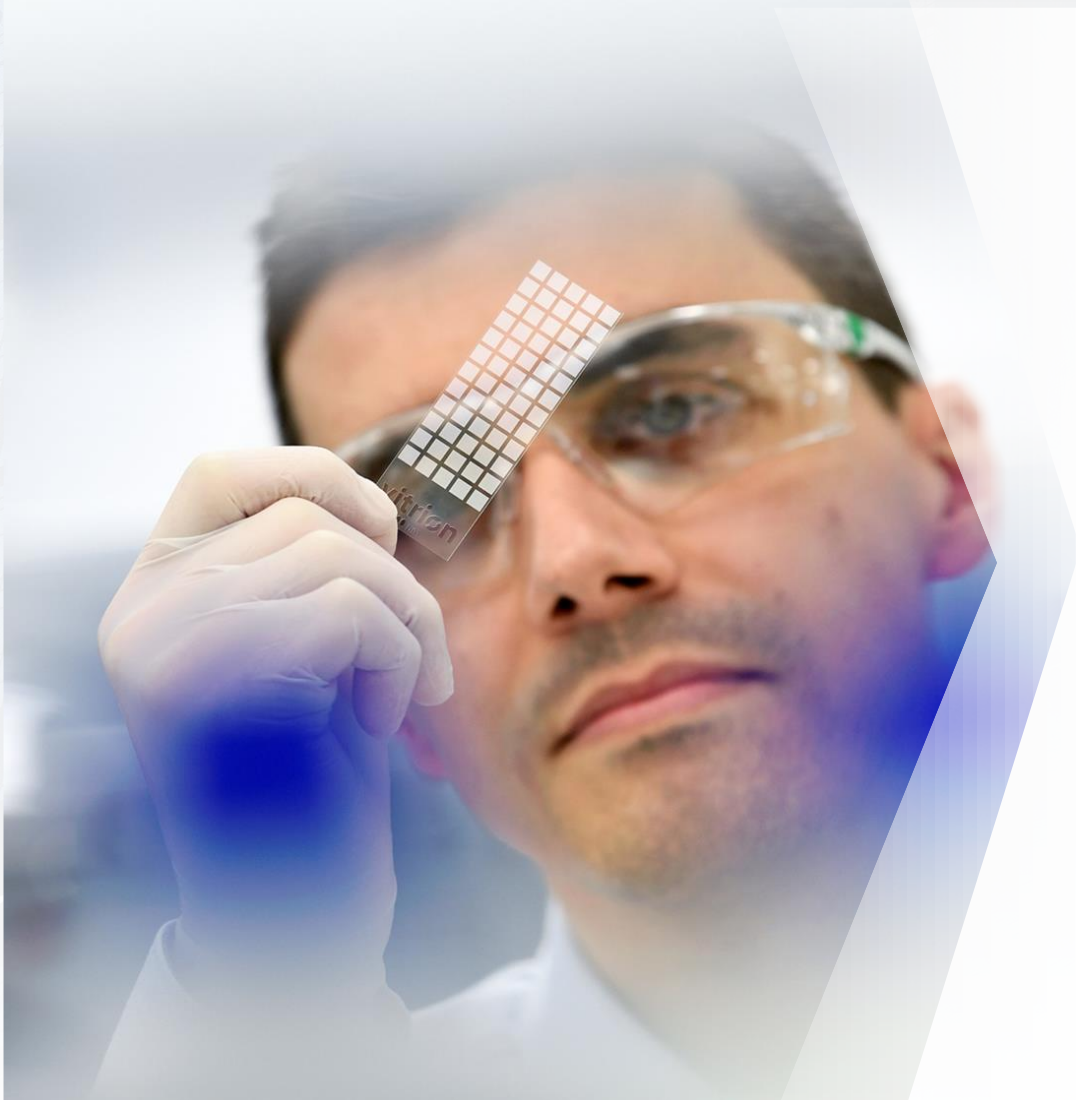
»» THANK YOU!



 BACKUP

LIDE USED IN SERIES PRODUCTION OF GLASS WAFERS

LEADING CHIP MANUFACTURER ORDERED PRODUCTION SYSTEMS



November 2019:

Leading global chip manufacturer ordered LIDE evaluation system

January 2020:

Start of qualification phase

June 2021:

Customer ordered further LIDE systems to start volume production of electronic components with IC packages made of glass.

Order volume:

EUR 5 – 7 million, revenue expected in 2022.

» INCREASING EBIT-MARGINS

OPERATING LEVERAGE INCREASES PROFITABILITY



GROSS MARGINS

- Permanent product innovation in all Business Units, stable Gross Margins
- Margins LIDE and other new Business similar to today's business

INCREASED EFFICIENCY

- In indirect areas by 5-15 % p.a. over the next years
- e.g. digitalization of sales administration, accounting, etc.
- R&D to grow more than general fixed cost

OPERATING LEVERAGE

- Underproportional growth of fixed cost – increase in EBIT margin

EXPECTED SALES GROWTH 2019 – 2024: +160 %

EXPECTED FIXED COST 2019 – 2024: +80 %

HISTORICAL MARGINS CONFIRM OPERATING LEVERAGE

- EBIT Margin 2017/18: 4-6% (adjusted ca. 0-8%)
2019: 13.7% - 2020: 7.8% (Corona impact) - 2024: >25%

ASSET-LIGHT BUSINESS MODEL

SUFFICIENT PRODUCTION CAPACITIES WITH ASSET LIGHT ASSEMBLY



DEVELOPMENT

- Production Capacity 2 x 2019



ELECTRONICS

- Production Capacity 2 x 2019
+ LIDE equipment production



WELDING

- Production Capacity 4 x 2019



SOLAR

- Production Capacity 2 x 2019



Core Business and LIDE Equipment: Assembly, no machining, low value add in production



LIDE FOUNDRY

- EUR 15 - 25 million investment during 2021 – 2024
- Phase 1: completed in 2020

WORKING CAPITAL AND FREE CASH FLOW

ATTRACTIVE FREE CASH FLOW WITH HIGH CASH CONVERSION



NET WORKING CAPITAL TARGET

- Target: < 10% of annual revenue
- 2018: 31.6 - 2019: 12.2% - 2020: 21.3% (Corona impact)

EQUIPMENT

- < 30 days incl. down payments

SERVICE

- 30 days (< 30 days DSO, some inventory)

FOUNDRY

- 30 days (only DSO, rest insignificant)

FREE CASH FLOW

- Growing Working Capital and Investments financed by Profitable Business
- Will continue to see order and investment based swings
- Attractive Free Cash Flow, LPKF remains debt free
- Dividend policy based on Free Cash Flow