**LPKF AT A GLANCE**

**A LEADING TECHNOLOGY COMPANY**

**LASER SPECIALIST**
- **Leading** supplier of laser-based precision manufacturing solutions
- **Enabler** of miniaturization and advanced electronic manufacturing
- **>40 years of experience** plus strong innovation pipeline
- Investing around **10% of revenue in R&D**

<table>
<thead>
<tr>
<th>Segments</th>
<th>Development</th>
<th>Electronics</th>
<th>Solar</th>
<th>Welding</th>
</tr>
</thead>
</table>

**GLOBAL PLAYER**
- Selling in **71 countries**; Export share of approx. **90 %**
- **Largest market**: Asia
- Ca. **650 employees world-wide**
- Engineering and technological know-how **based in Europe**

**Revenue by region in % 2019**
- Germany: 20.9%
- Europe: 43.4%
- Asia: 26.8%
- N. America: 6.9%
- Others: 2.0%

**DYNAMIC MARKETS**
- **Highly specialized segments** for clients in Research & Development, Consumer Electronics, Semiconductor, Automotive and Solar
- **Focus on fundamental manufacturing innovations** with distinct USPs
- **Capturing growth opportunities** by creating new markets

**Revenue by segment in € million 2019**
- Development: 44.1 million
- Electronics: 43.7 million
- Solar: 27.7 million
- Welding: 24.5 million

**PROFITABLE GROWTH**
- **Q3 2020 Guidance**
  - Revenue: 23 – 27 million EUR
  - EBIT: 1 – 3 million EUR
- **FY 2020 Guidance**
  - Quantitative Guidance 2020 forthcoming
- **FY 2024 Guidance**
  - Revenue: > 360 million EUR
  - EBIT margin: > 25%

**EBIT development in € million**
- Q1 19: 6.1
- Q2 19: 4
- Q3 19: 5.2
- Q4 19: 3.8
- Q1 20: 6.1
- Q2 20: 5.2

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MEGATRENDS
OUR MARKETS ARE DRIVEN BY SEVERAL MEGATRENDS

Miniaturation
- 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
COMPETITIVE ADVANTAGE
from superior customer value and accelerated innovation

CORE COMPETENCIES
- Laser Technology and Optics
- Control Technology and Software
- Precision Drive Technology
- Materials Technology

KEY DIFFERENTIATORS
- Deep understanding of customer requirements
- Proprietary process know how
- Expertise in engineering, software, physics, and chemistry
- Group-wide machine software platforms
- Innovation power: ≈ 10% of revenue p.a. in R&D
- Low degree of vertical integration

DRIVERS OF OUR COMPETITIVE ADVANTAGE
WE DERIVE DIFFERENTIATION FROM MULTIPLE SOURCES
GLOBAL MARKETS AND PARTNERS
STONG PRESENCE IN ALL GLOBAL GROWTH AREAS

LPKF solutions are sold in more than 70 countries.

We have an extensive global sales & service network, including 8 subsidiaries.

We have 4 R&D and production sites in Europe.

- Locations
- Representatives
OUR FOUR BUSINESS SEGMENTS
WIDE RANGE OF TAILOR-MADE SOLUTIONS

LPKF LASER & ELECTRONICS AG

Development
- Solutions for In-house PCB prototyping and micromaterial processing

Electronics
- Solutions for volume manufacturing of PCB and PCBA
- LIDE - Thin glass processing

Welding
- Solutions for plastic welding in volume manufacturing

Solar
- Solutions for thin-film photovoltaic module production
- Digital printing of ceramic inks via Laser Transfer Printing (LTP)

BUSINESS SEGMENT STRATEGY

- Leverage increasing synergies across segments in R&D, production, sales and service.
- Become both technology and market leader in each segment we operate in.
- Accomplish sustained profitable growth in each business segment.
**MAIN CUSTOMER SEGMENTS**
**DRIVING GROWTH ACROSS KEY HIGH TECH INDUSTRIES**

<table>
<thead>
<tr>
<th>LPKF LASER &amp; ELECTRONICS AG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research &amp; Development</td>
</tr>
<tr>
<td>Consumer Electronics</td>
</tr>
<tr>
<td>Automotive</td>
</tr>
<tr>
<td>Solar</td>
</tr>
<tr>
<td>Semiconductor</td>
</tr>
<tr>
<td>Medical</td>
</tr>
</tbody>
</table>

- Universities
- Schools
- Design houses
- Manufacturers
- Governments

- OEMs
- PCB manufacturers
- PCB assemblers
- integrated manufacturers

- Tier 1 and Tier 2 Automotive suppliers
- OEMs

- Thin film solar module manufacturers

- IDMs
- Fabless
- Foundries
- OSATs

- Suppliers of microfluidic and other high end medical devices

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SEGMENT “DEVELOPMENT”
LEADING IN RAPID PROTOTYPING WORLD-WIDE

MARKETS/CUSTOMERS/APPLICATIONS

- Universities
- Schools
- R & D in industry

MARKET POSITION AND COMPETITION

- Extensive world-wide sales & service network
- Competitors: MITS (J), Accurate CNC (USA) and other smaller suppliers

Approx. 60% market share

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SEGMENT “ELECTRONICS”
LASER SYSTEMS FOR CUTTING PCBS & Stencils

MARKETS/CUSTOMERS/APPLICATIONS

- OEMs, PCB manufacturers and PCB assemblers

MARKET POSITION AND COMPETITION

- Competitors:
  HAN’s (CN)
  Schmoll (D),
  EO Technics (KR)
  VIA Mechanics (JP)
  HG Laser (CN)

Printed-Circuit-Boards

Market leader

New PowerCut 6080
SEGMENT “ELECTRONICS”
LIDE: ULTRA FINE DRILLING AND CUTTING OF VERY THIN GLASS

MARKETS/CUSTOMERS/APPLICATIONS

- Displays
- Advanced IC Packaging
- Wafer level packaging
- Microfluidics and Bio Science
- Micro-electro-mechanical systems (MEMS)
- Through glass via substrates

MARKET POSITION AND COMPETITION

- Patented process
- Pioneer in glass machining
- Competition:
  Alternative technologies (e.g. Coherent)
  Large glass producers (Corning, USA)
  Small specialized glass producers

Vitrion cuts up to 5000 holes in 1 second
LASER INDUCED DEEP ETCHING
UNIQUE AND PATENTED LPKF PROCESS

THE LIDE PROCESS

1. Standard silicate glasses
2. On-the-fly laser modification
3. Standard wet etching
SURFACE DEFECTS
LIDE: MECHANICAL STRENGTH AND PRECISE DEEP HOLES

STANDARD LASER PROCESSED GLASS

DEFECT FREE HOLES MADE BY LIDE TECHNOLOGY

© LPKF Laser & Electronics AG
Alternative approach of foldable glass using thick glasses.

High precision cutting of glass allows implementation of localized foldable micro-features. Protection of sensitive display components is warranted by thick glass.

Two applications in each foldable smartphone:
1. Display backplane (Substrate during production)
2. Display cover glass

Thin layer deposition possible for backplane application. Both polymer and metal layer deposition is possible.

No plastic deformation in the glass.

No fatigue caused by folding is known for glass.

As a cover glass thick foldable glass is superior in its features in comparison to Ultra Thin Glasses or Polymer films as cover materials.
DIRECT PENCIL CUT

Outline Cutting → Pencil Grinding → Pencil Polishing → Optional: Scratch Healing by Etching → Chemical hardening

Outline Modification → Etching → Chemical hardening

LPKF Patented process
EXAMPLE FOR WAFER LEVEL PACKAGING

Higher Density and Precision
GLASS EMBEDDED FAN-OUT PACKAGING
ADVANCED IC PACKAGING

- **Warpage:**
  - CTE mismatch between redistribution layer (RDL) and epoxy molded compound (EMC)
  - Low Young’s modulus of the EMC
- **Moisture uptake by EMC:**
  - Long degassing
  - Impact on RF properties
- **Low throughput/yield of through-mold vias formation**
- **Die position errors:**
  - Placement
  - Shift during molding

**Fan out packaging:** [https://www.youtube.com/watch?v=pOBkSEOLqZ8](https://www.youtube.com/watch?v=pOBkSEOLqZ8)
GLASS EMBEDDED FAN OUT PACKAGING
MICROFLUIDIC APPLICATIONS:
PICO WELLS APPLICATION – single cell or DNA analysis ("Omics")

• well size: 5-200 micrometers
• well distance: 1 to 100 micrometers
• 10 – 1000 x higher density

For more information on LIDE and microfluidics:
ARRALYZE: NEW BUSINESS FOR LIFE SCIENCES APPLICATIONS

ARRALYZE launched in April 2020

- Picowell Glass Materials
- Small & Customizable Features
- Inert Glass Material
- Enabled by VITRION (LIDE)

ARRALYZE advantages at a glance

Find out what ARRALYZE is about and how to take advantage of all features
ARRALYZE: NEW BUSINESS FOR LIFE SCIENCES APPLICATIONS

Multifunctional platform for seamless cellomics research and development

ARRALYZE Launched in April 2020
- Arralyzer Workstation Platform
- Handling of nL and pL Volumes
- Live Optical Analysis
- Enabled by LPKF Protomat
SEGMENT “WELDING”
LASER WELDING OF PLASTIC COMPONENTS

MARKETS/CUSTOMERS/APPLICATIONS

- Automotive
- Consumer Electronics
- Medical Devices
- Others

MARKET POSITION AND COMPETITION

- Market leader in Europe, strong growth potential in America, China and Asia-Pacific
- Competitors: Branson, Leister (CH), Evosys, Coherent (USA), Gefasoft

RFID sensor for blood bag
Automotive tail light

Market leader in Europe

New InlineWeld 2000
MARKETS/CUSTOMERS/APPLICATIONS
- Thin film solar module manufacturers
- CIGS and CdTe technology

MARKET POSITION AND COMPETITION
- Competitors:
  Mitsuboshi Diamond Industrial (JP) and Innolas (D)

* sample-size

Thin-Film Solar Module *

Market leader

New system from Allegro family
SEGMENT “SOLAR”
LASER TRANSFER PRINTING

LASER TRANSFER PRINTING

- Digital printing technology that can replace conventional screen printing in specific areas
- Non-contacting and extremely flexible laser process
- Printing of large pigments possible
- Ideal for printing small batches

MARKETS & APPLICATIONS

- Display
- Flat Glas (Architectural)
- Household appliances
- Transportation
- Printed Electronics
- Others

Adjustment of printing head – LPKF Callisto
REVENUE AND EBIT: LONG TERM DEVELOPMENT
RETURN TO SUSTAINED PROFITABLE GROWTH

• **2011 – 2015**: Expansion followed by slow-down 2015 driven by LDS technology

• **2017**: Return to profitability via reduced cost and growth in Solar, Development, Electronics

• **2018/19**: Management program on profitable growth focusing all segments, cost reduction, cash and working capital management

• **Quantitative Guidance 2020**: forthcoming

• **Guidance 2024**: Revenue: > 360 million EUR EBIT-margin: > 25 %
**KEY GROUP FIGURES: 6 MONTHS 2020**

<table>
<thead>
<tr>
<th>in Mio. EUR</th>
<th>6 months 2020</th>
<th>6 months 2019</th>
<th>Δ%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>50.0</td>
<td>72.7</td>
<td>-31.2</td>
</tr>
<tr>
<td>EBIT</td>
<td>2.8</td>
<td>10.1</td>
<td>-71.7</td>
</tr>
<tr>
<td>EBIT margin (%)</td>
<td>5.7</td>
<td>13.9</td>
<td></td>
</tr>
<tr>
<td>Earnings per Share (€)</td>
<td>0.08</td>
<td>0.30</td>
<td>-72.5</td>
</tr>
<tr>
<td>Free cashflow</td>
<td>-12.4</td>
<td>17.8</td>
<td>-169.8</td>
</tr>
<tr>
<td>Incoming orders</td>
<td>39.6</td>
<td>45.8</td>
<td>-13.7</td>
</tr>
<tr>
<td>Orders on hand (30 June)</td>
<td>21.9</td>
<td>31.4</td>
<td>-30.2</td>
</tr>
<tr>
<td>Employees (total number )</td>
<td>683</td>
<td>674</td>
<td>1.3</td>
</tr>
</tbody>
</table>

**Revenue:** Decline due to large projects delivered in H1 19, other revenue stable

**EBIT:** Increased profitability in Q2 due to cost reductions and fewer large projects

**Decline in Free Cashflow:**
- lower profitability and temporarily higher NWC

**Order situation:**
Delays of projects especially in Solar segment; fewer large orders; generally shorter customer lead times
## Revenue by Segment: First 6 Months 2020

<table>
<thead>
<tr>
<th>Revenue in Mio. EUR</th>
<th>6 months 2020</th>
<th>6 months 2019</th>
<th>Δ%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronics</td>
<td>15.4</td>
<td>20.5</td>
<td>-24.8</td>
</tr>
<tr>
<td>Development</td>
<td>9.8</td>
<td>12.0</td>
<td>-18.5</td>
</tr>
<tr>
<td>Welding</td>
<td>9.6</td>
<td>11.4</td>
<td>-15.6</td>
</tr>
<tr>
<td>Solar</td>
<td>15.2</td>
<td>28.8</td>
<td>-47.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50.0</strong></td>
<td><strong>72.7</strong></td>
<td><strong>-31.2</strong></td>
</tr>
</tbody>
</table>

- **All BUs: Delays due to Covid 19**
- **Electronics:** Lower sales due to large project in H1 19, increase in other sales
- **Development:** “Lost month(s)” due to lockdowns, plus moderate delays throughout
- **Welding:** Lower sales due to large project in H1 19, other sales stable
- **Solar:** Large deliveries in H1 19; shift of one medium size order from Q1 20 to Q3 20
## EBIT BY SEGMENT: FIRST 6 MONTHS 2020

<table>
<thead>
<tr>
<th>Segment</th>
<th>EBIT in Mio. EUR</th>
<th>6 months 2020</th>
<th>6 months 2019</th>
<th>Δ%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronics</td>
<td>1.0</td>
<td>3.7</td>
<td>-73.2</td>
<td></td>
</tr>
<tr>
<td>Development</td>
<td>0.7</td>
<td>1.3</td>
<td>-48.2</td>
<td></td>
</tr>
<tr>
<td>Welding</td>
<td>-1.5</td>
<td>-0.7</td>
<td>-107.0</td>
<td></td>
</tr>
<tr>
<td>Solar</td>
<td>2.7</td>
<td>5.8</td>
<td>-53.2</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2.8</strong></td>
<td><strong>10.1</strong></td>
<td><strong>-71.7</strong></td>
<td></td>
</tr>
</tbody>
</table>

### All Segments:
Cost Saving effects have enhanced profitability in Q2

### Electronics:
- Lower revenue, fewer large orders

### Development:
- Lower volume, relatively stable earnings

### Welding:
- Positive EBIT in second quarter.

### Solar:
- Lower revenue, less traded components with low margin
### FREE CASHFLOW AS PER 30 June 2020

<table>
<thead>
<tr>
<th></th>
<th>6 months 2020</th>
<th>6 months 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net cash used in/generated by operating activities</td>
<td>-6.9</td>
<td>20.0</td>
</tr>
<tr>
<td>Net cash used in investing activities</td>
<td>-5.5</td>
<td>-2.3</td>
</tr>
<tr>
<td>Free cashflow</td>
<td>-12.4</td>
<td>17.8</td>
</tr>
<tr>
<td>Net cash position as per June 30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net working capital</td>
<td>26.7</td>
<td>32.4</td>
</tr>
</tbody>
</table>

**Net Working Capital effects 2020:**

- **EUR 3.3 million temporary inventory vs. year end 2019 to cover potential supply chain issues (was 6.6m in Q1), further reduction in Q3/Q4**
- **higher receivables vs. year end because of higher sales in June**
- **lower advance payments (Solar)**

**Investment includes LIDE foundry**
GUIDANCE AS OF 5 August 2020

**Financial Year 2020**

In February 2020 the management Board has forecasted increasing sales and profits for 2020 in a stable economic environment.

Forecasting ability for 2020 under the current economic situation caused by COVID-19 is severely limited.

In the event of a more pronounced recession, LPKF will have to anticipate a decline in revenue and earnings in 2020.

**Q3 2020**

For Q3 2020, LPKF anticipates:

- Group sales of 23-27 million EUR
- EBIT of 1-3 million EUR

**... up to 2024**

For 2024, LPKF anticipates:

- Group sales of more than 360 million EUR
- EBIT margin of more than 25%

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

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Backup
NEW MANAGEMENT BOARD SINCE 2018
STRONG AND EXPERIENCED TEAM

MANAGEMENT BOARD

Dr. Götz M. Bendele (CEO) and Christian Witt (CFO)

GÖTZ BENDELE
Chief Executive Officer (CEO)
• Board Member since 2018
• Joined LPKF Group in May 2018
• Worked as management consultant followed by various leadership roles across the high tech industry

CHRISTIAN WITT
Chief Financial Officer (CFO)
• Board Member since 2018
• Joined LPKF Group in September 2018
• Many years of experience as CFO in industrial and high tech companies
THE LPKF SHARE – MEMBER OF SDAX INDEX
PERFORMANCE AND STRONG PERCEPTION

SHARE PRICE DEVELOPMENT August 2019 – August 2020

ANALYST COVERAGE
• Warburg Research GmbH, Robert-Jan van der Horst
• MainFirst, Florian Pfeilschifter
• Hauck & Aufhäuser, Alina Köhler, Tim Wunderlich
• HSBC, Richard Schramm
• Quirin Privatbank AG, Klaus Soer
• EQUI.TS GmbH, Thomas Schießle

SHAREHOLDER STRUCTURE

100% of the LPKF Laser & Electronics AG’s shares are in Free Float.

Major shareholders:
• The Capital Group / Small Cap World Fund ( > 5 % )
• Société Générale S.A. ( > 3 % )
• UBS Group (ca. 3 % )
• JPMorgan Asset Management (UK) Limited (ca. 3 % )

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