



**DYCONEX**

an MST company

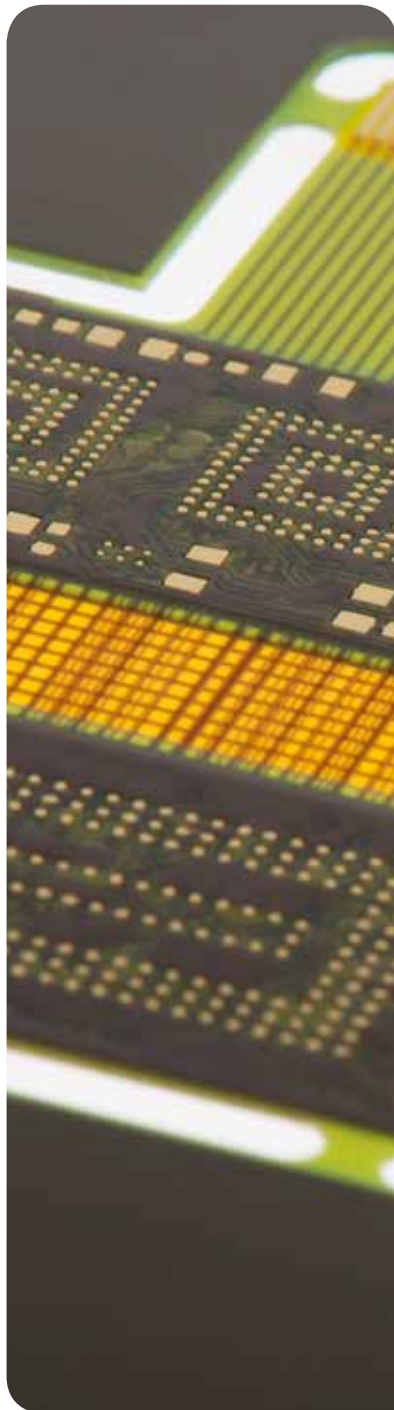
Bringing together experts in  
high-reliability PCB technology



Micro Systems Technologies  
engineering for life

# Progress through PCB technology

At DYCONEX, we ensure that we have the right knowledge, quality, reliability and traceability so that our customers can fully rely on our technologies and our processes – all while complying with regulatory requirements. We rely on state-of-the-art equipment, cleanroom technology and highly skilled professionals.



## Products

Your requirements are our challenge. We offer every type of leading-edge PCBs and organic substrates with the highest degree of commitment and flexibility. Full traceability is guaranteed from the lot level down to the individual print on a panel as well as for all base materials.

### FLEX & RIGIDIZED FLEX PCBs

- Ultra-HDI multilayer flex PCBs
- Ultra-thin materials
- Ultra-fine line cables
- 3D miniaturization
- Filled and stacked microvias
- Buried, blind, staggered and stacked vias

### RIGID-FLEX PCBs

- Ultra-HDI multilayer rigid-flex PCBs
- High-grade 3D miniaturization
- Sequential and parallel build-ups
- Versatile combinations of base materials
- Thinned bending zones
- Book binder build-ups

### LCP SUBSTRATES

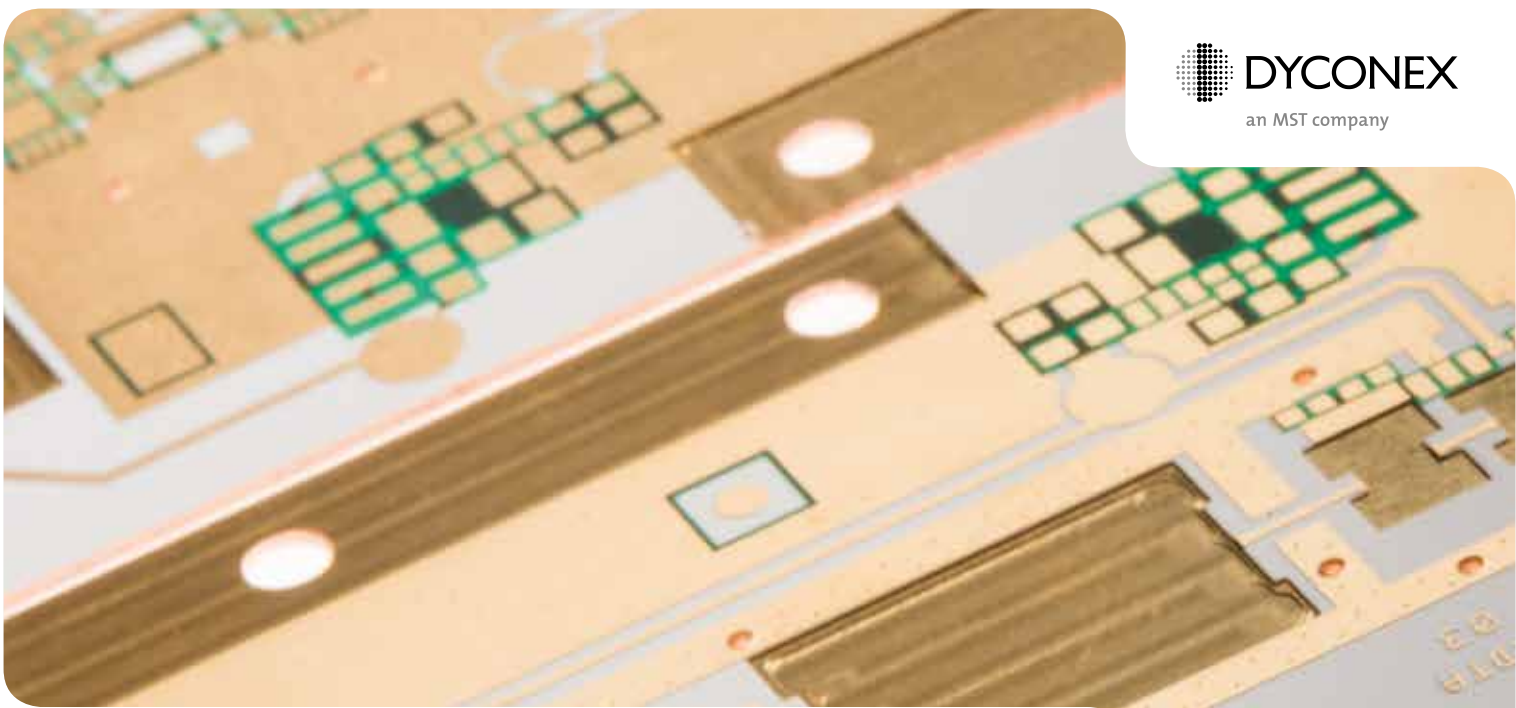
- Very flexible thermoplast
- Near hermetic due to very low water absorption
- Temperature stable up to 190°C
- Low weight
- Excellent high frequency properties
- Fully biocompatible base material

### RIGID PCBs

- Ultra-HDI multilayer rigid build-ups
- Buried, blind, staggered and stacked vias
- Profiles, cavities, cut-outs and castellations
- Low CTE materials
- Thermal management solutions
- Constraining materials such as CIC, CMC, CCC

### PACKAGING SUBSTRATES

- Substrates for SDBGAs, CSPs, SiPs and MCMs
- Ultra-thin materials for light-weight build-ups
- Stacked vias and via-in-pad
- High density pitch design
- Die cavities
- Anylayer or HDI technology



## Pure passion for engineering

Innovations and advanced technology development are an integral part of our corporate culture – continuously preparing for upcoming PCB challenges. Comprehensive engineering services throughout the product life cycle ensure optimized PCB solutions for your demanding needs.

### MINIATURIZATION

- Ultra-thin base materials
- Ultra-fine line technology
- Microvias, via stacking and filled vias
- LDI technology
- Advanced registration concepts
- Thin film technology

### FUNCTIONALITY

- Alternative conductors
- High performance base materials
- Folded systems
- Embedding
- 3D shaping
- Stretchable PCBs

### BIOCOMPATIBILITY

- Biocompatible base materials such as LCP or PI
- According ISO 10993-5 tested (in vitro cytotoxicity)
- Thin film noble metal traces
- For short term and long term implants
- Embedding of active and passive components
- Full module encapsulation by LCP

### THERMAL MANAGEMENT

- Wrap-around technology
- Metal sheets as backpanels
- Metal inserts and cores as heat sink
- Thermal vias for heat dissipation
- Copper filled microvias for high reliability
- CIC technology to control thermal expansion

### HIGH FREQUENCY

- LCP base material
- Advanced rigid multilayer material
- High Tg, low CTE and high dielectric strength
- Impedance control
- Highly reliable anylayer build-ups
- Chip cavities for short wire bonds

### RELIABILITY / PREDICTABILITY

- Design for reliability
- Digital factory with full traceability
- Integrated control and inspection concept
- Two-stage approach to data processing
- IST testing and analysis
- Maverick control



# Adding value for high-reliability industries

With its traditional, strong focus on the healthcare sector, DYCONEX understands the unique needs and characteristics of high-end, high-reliability customers. We manufacture under stringent conditions and according to ISO 9001, ISO 13485 and EN 9100 standard.

## Medical technology

### MEDICAL IMPLANTS

With more than 20 years of experience in delivering high-end PCBs for life-sustaining active implants we are a reliable partner for this challenging market.

Pacemakers and defibrillators

Implantable monitors

Neurostimulators

Cochlear implants

Implantable pumps

Smart electrodes

Glaucoma implants

### THERAPY DEVICES

We supply high-end PCBs to market and technology leaders in the hearing aid industry. From development to prototyping through serial production, customers rely on our ultra-HDI flex and rigid-flex PCB solutions.

Hearing aids (BTE, ITE, ITC, CIC)

Hearing support devices

Ventricular assist devices

Drug pumps

Drug delivery pills

Ablation catheters

Dialysis equipment

### DIAGNOSTICS AND MEDICAL IMAGING

Substrates for medical imaging applications are technically extremely demanding. Ultra-fine line flex build-ups, ultra-fine pitch transducer pad arrays and high connection pad densities characterize these applications.

Ultrasound probes

X-ray detectors

CT scanners and MRIs

Smart catheters

Ingestible imaging capsules

Glucose meters

Endoscope technology



## Industrial sectors

### AEROSPACE & DEFENSE

Having its origins in the Swiss defense industry, DYCONEX has a genuine understanding of the challenging high-reliability characteristics and requirements of aerospace & defense electronics. DYCONEX is EN 9100 certified.

Civil aviation

Military aircraft

Radar technology

Satellites

UAVs

C4i applications

Missile technology

### INDUSTRIAL

With a proven track record in various industrial segments, DYCONEX understands and responds to customers' varying needs throughout their products' life cycle.

Printing equipment

Sensor solutions

Micro motors

Measuring equipment

Control technology

Imaging equipment

Security solutions

### TELECOMMUNICATION

DYCONEX PCB solutions address the increasing speed and density requirements of the telecomm industry. Our unique technology portfolio ranges from advanced material sets to dedicated design features.

Optical transceivers

RF switches

High-speed transmission control units

Phased array antennas

Low gain antennas

Interposer packages

High-speed cables

### OTHER MARKETS

Our technological expertise and the high level of quality assurance are reflected in all DYCONEX PCBs. These factors make us the partner of choice for any high-tech industry in the electronics sector.

Semiconductor packaging

Swiss electronic watches

Lab equipment

Transportation

Full-body scanners

Scientific applications

High-end computing



# Sustainable Swiss quality

Years of experience working in the field of life-sustaining medical devices and high-end industrial projects have led to our uncompromising quality management system. Our goal is to assure predictability in the manufacture of high-complexity PCBs. In order to meet this challenging expectation we have developed an integrated control and inspection concept allowing us to continuously improve our business and production processes.



## QUALITY TOOLS

The implementation of advanced quality tools and techniques provides accountability and is an essential ingredient in our effort for sustainable improvement.

- Full traceability for every single PCB
- First article inspection
- 8D reports
- DOE, SPC and measuring system analysis (MSA)
- Six Sigma methodology
- Change management
- IQ/OQ/PQ validation methodology
- Corrective and preventive action (CAPA) process
- Customized inspection concepts and reports
- Maverick control

## INSPECTION & TEST

Enabled through sophisticated equipment and skilled professionals, we are determined to supply only high-reliability, Swiss quality solutions to our markets.

- 100% electrical testing
- Automated optical inspection
- Automated final inspection
- Micro-section control
- Interconnect stress test (IST)
- Bondability analysis
- Ionic contamination measurement
- X-ray inspection
- FPC bending tests
- Scanning electron microscope

## APPROVALS & STANDARDS

Our approvals and quality management system demonstrate the ability to provide PCB solutions that consistently meet applicable customer and regulatory requirements.

- ISO 9001, ISO 13485 and EN 9100 certified
- Manufacturing and testing according to IPC standards and customer-specific requirements
- Certified Six Sigma Black Belts and IPC qualified employees
- RoHS and REACH compliance

## WHY CHOOSE DYCONEX?

### TECHNOLOGY LEADERSHIP

- Delivering state-of-the-art interconnect technology with the highest degree of production flexibility
- Significant investment in future technologies enabling your next generation development
- Part of the Micro Systems Technologies (MST) group with a unique set of technical capabilities

### GLOBAL LEADER IN MEDICAL FLEX PCBs

- Long-term experience in high-reliability PCB manufacturing for active medical implants, hearing aids and medical imaging applications

### HIGH PERFORMANCE IN QUALITY AND RELIABILITY

- Quality systems and culture derived from Class III life-sustaining implant, aerospace and defense markets

### CONSULTING AND TECHNICAL SUPPORT

- Design for manufacturing, design-to-cost, design-to-performance
- Prototyping services

### PRODUCTION FACILITY

- Leading-edge production and testing
- Well organized manufacturing environment

### STRONG FINANCIAL PROFILE

- Privately owned, long-term perspective





# About us

## YOUR RELIABLE PCB TECHNOLOGY PARTNER

Based in Switzerland, DYCONEX AG is one of the world's leading providers of highly complex and highly reliable solutions in the area of interconnect technology. The company has its seeds in a 1964 founded division within Oerlikon-Contraves and acts as DYCONEX since a management buy-out in 1991. As one of the true pioneers in the industry, DYCONEX has continuously applied the latest technology to derive innovative technologies for various markets.

We provide a competitive edge for your business through our high-end interconnect expertise and we are an extremely reliable and predictable partner who can deliver products and services with premium quality.

Due to long-term dedication and expertise, DYCONEX has earned a solid reputation for being a technology leader and the partner of choice for providing leading flex, rigid-flex and rigid ultra-HDI/microvia circuit boards, LCP and chip packaging solutions.

DYCONEX is ISO 9001, ISO 13485 and EN 9100 certified and a company of the MST group.



## MICRO SYSTEMS TECHNOLOGIES

The Micro Systems Technologies (MST) Group provides innovative solutions from concept to volume production for medical devices, in particular for active implants, which represent a special application area for MST products. In addition, other technologically advanced industries that demand exceptional performance and the highest level of reliability rely on the expertise of the MST Group. Its synchronized operating facilities – located in Switzerland, Germany and the United States – allow MST to be active worldwide and maintain global business relationships.

Just some of the products and services that the MST Group currently offers include: HDI/microvia PCBs, ceramic substrates, electronic module design and manufacturing, advanced assembly and semiconductor packaging technologies as well as batteries and battery packs for medical implants.

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- The MST Companies:
- DYCONEX AG
  - LITRONIK Batterietechnologie GmbH
  - Micro Systems Engineering GmbH
  - Micro Systems Engineering, Inc.
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