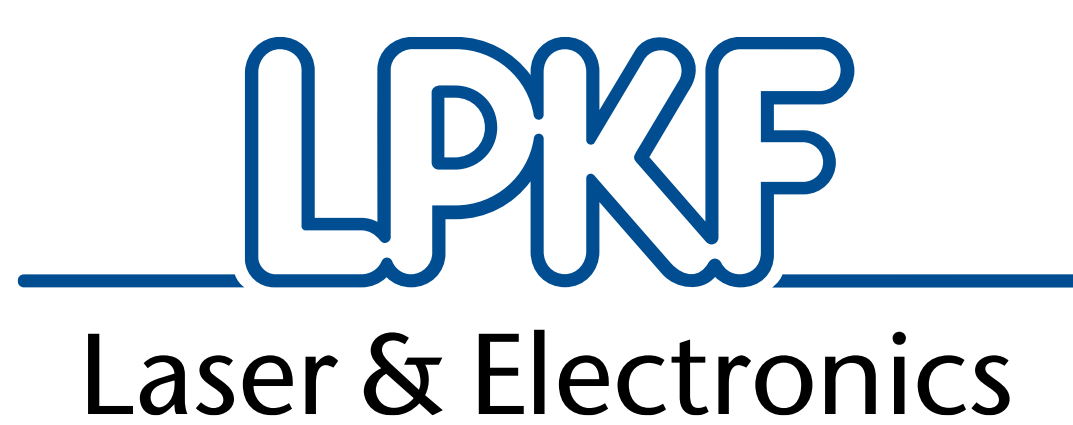


Quantum Computer in the Solid State

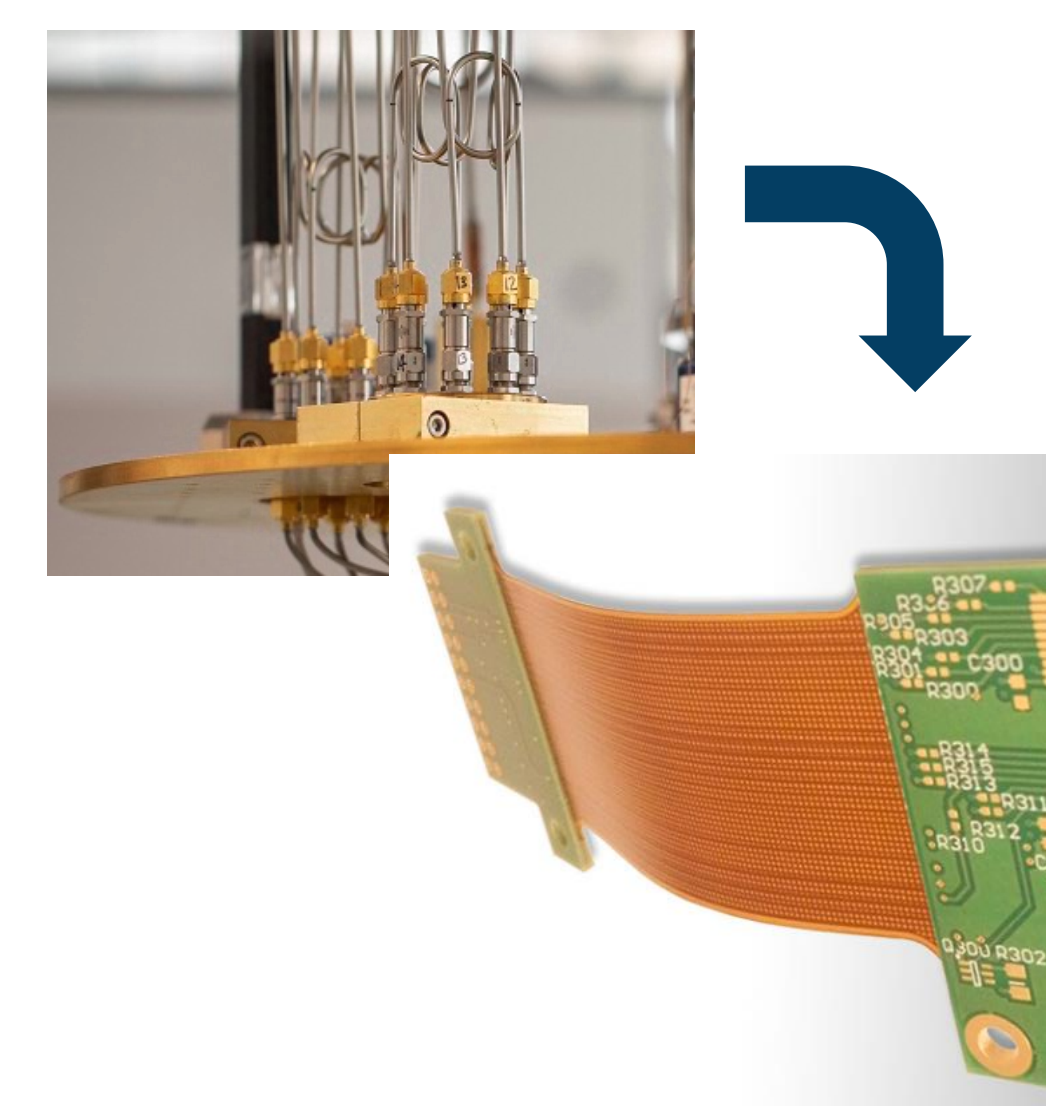
Partner: LPKF Laser & Electronics



- LPKF is a leading company in the field of system technology for laser material processing
- LPKF offers systems and processes for microelectronic production, PCB prototyping, polymer welding, solar
- Founded in 1976 / IPO in 1998
- Staff: 690, Revenue 2021: 94 Mio. €
- 10% of revenue invested in R&D

LPKF's Contribution

- Electrical and signal wiring in UHV systems is commonly done with rigid coaxial cables
- These shall be replaced with flexible, bespoke, flat cables with multiple channels in each
- LPKF has long-standing expertise in PCB processing for electronics prototyping
- We will use our system technology and expertise to develop space-saving, flat, flexible, super-conducting cables



Challenges

- Identification of materials with suitable properties
- Handling of flexible materials while meeting stringent requirements for resolution, RF properties, temperature resistance and reliability
- Adapt system technology and processes to the variety of materials under investigation
- Demo cables with up to 80 channels spaced <1 mm apart, 50 Ohm impedance at 2-12 GHz, and low losses
- Characterization results should show potential and limitations of the technology

Approach

- LPKF's contribution is based on lab equipment used for process development with customer materials (see below)
- This equipment will be adapted to project requirements, different applicable (super-conducting) materials will be evaluated, and the processes adjusted to achieve specifications defined by project partners

Tools available for project:

- ProtoLaser R4: flexible laser tool for many materials, main application: thin film processing for PCBs
- MultiPress S4: Tool for stacking and laminating multi-layer PCBs
- Already tested for processing of Metal on FR4, Metal on PTFE, Metal on PI, Pt on LCP, Alumina and other ceramics, GaN, Si

→ On this basis, LPKF will provide test structures and demo cables to partners

Work Plan

AP4.3.1 Specifications:

- Gather specifications, requirement etc.

AP4.3.2 Adaption of systems:

- Adapt lab systems to requirements

AP4.3.3 Process development

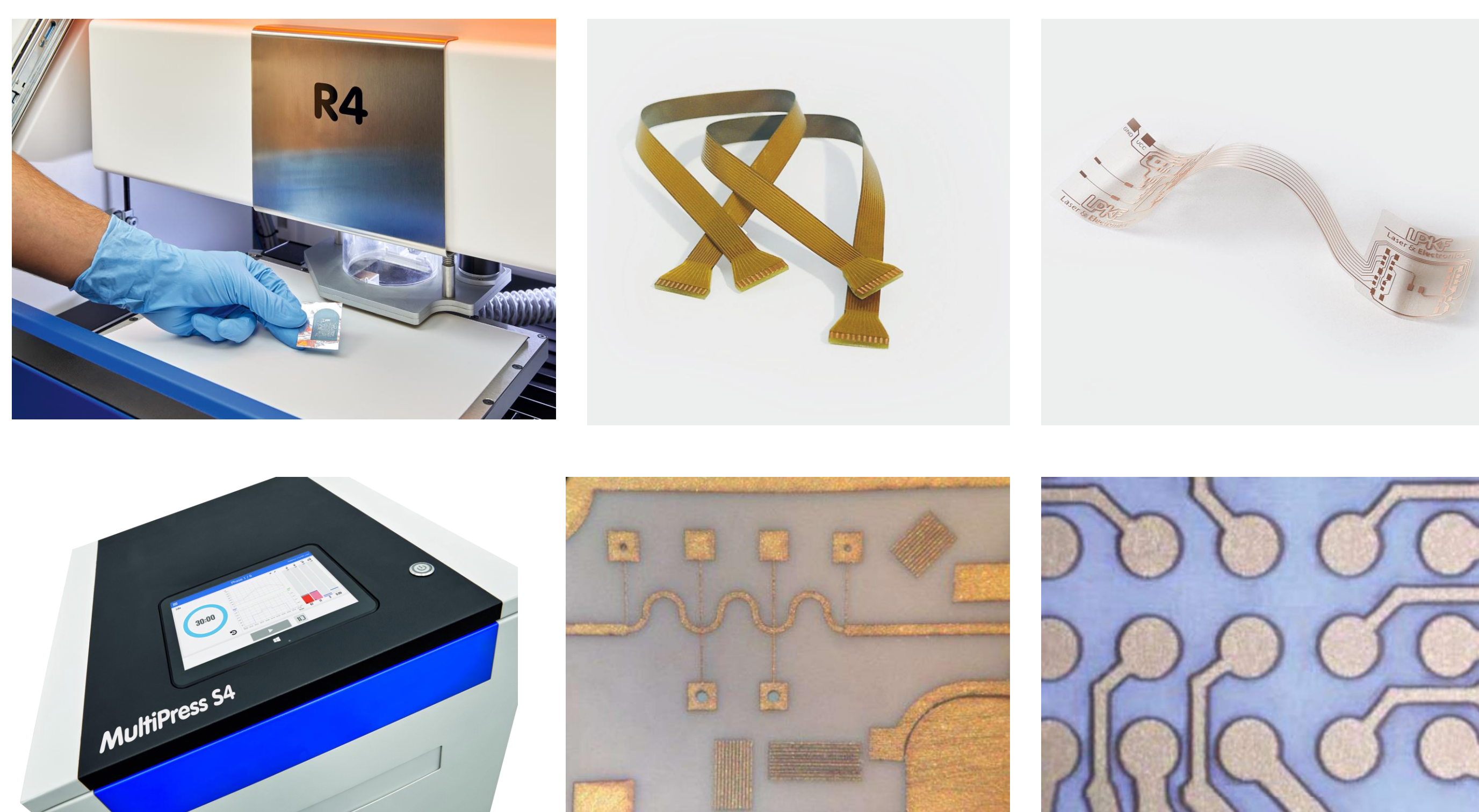
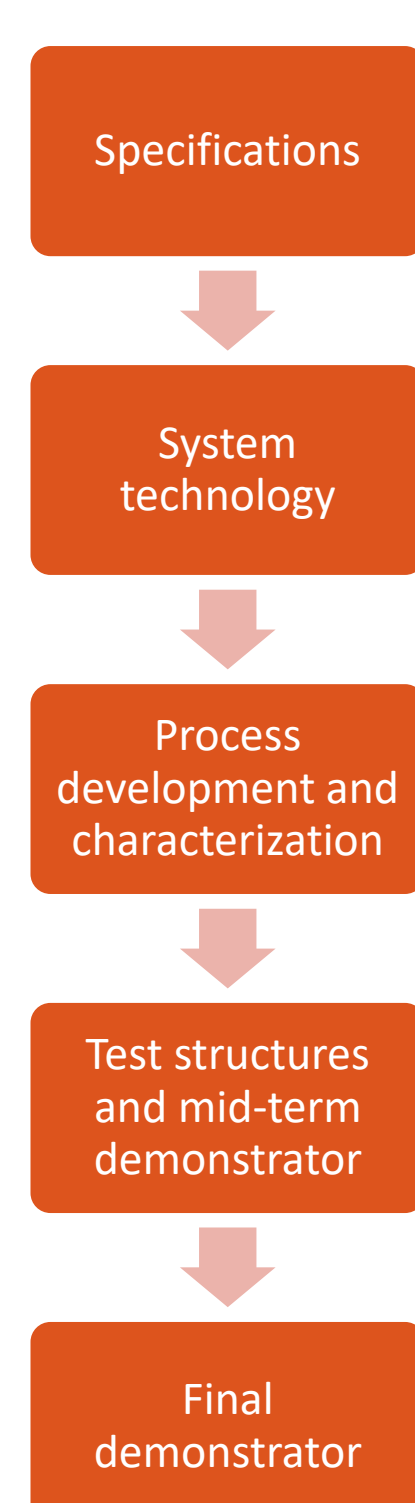
- Adapt processes to material and requirements

AP4.3.4 Mid-term Demonstrator

- Provide test structures for characterization and integration in mid-term demo

AP4.3.5 Final demonstrator

- Provide final flex cables for final demonstrator



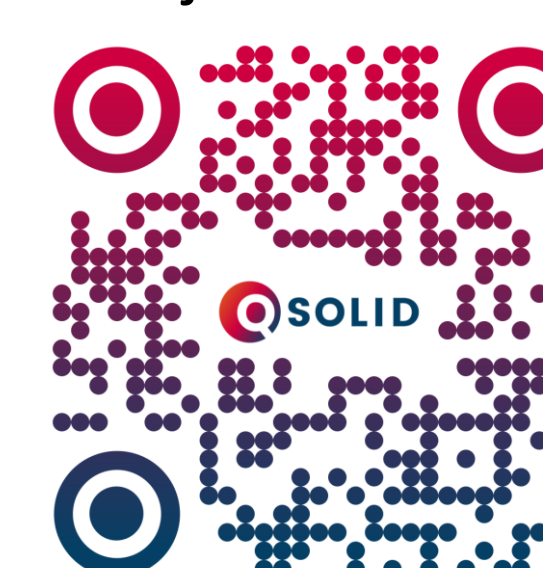
Collaboration



Further information

Link to Poster

Project Website



SPONSORED BY THE



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